

# THE

# IRON AGE

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

Vol. LI: No. 4. New York, Thursday, January 26, 1893

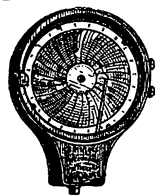
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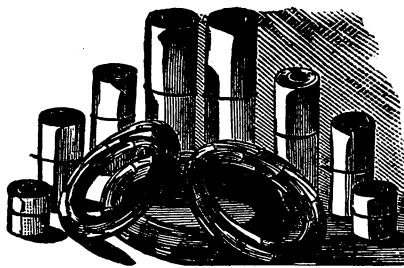
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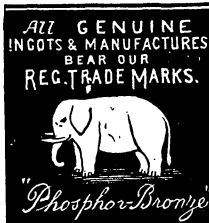
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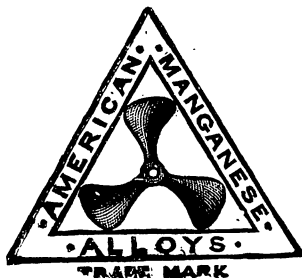
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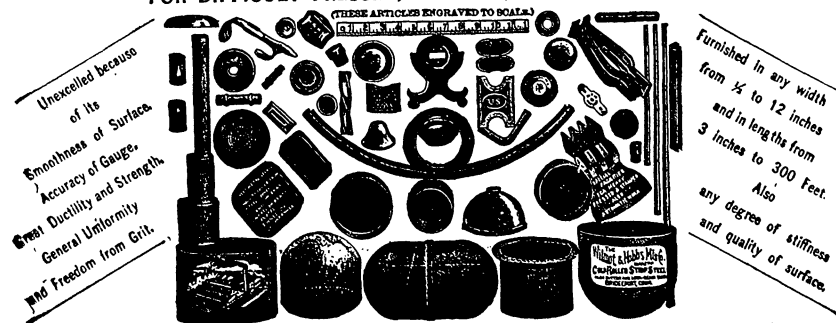
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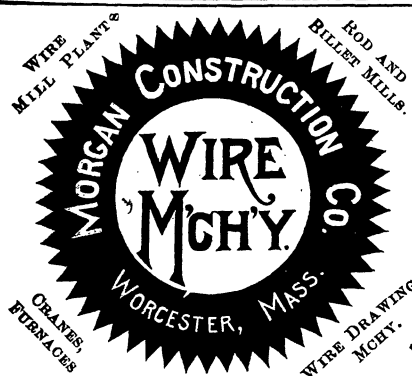
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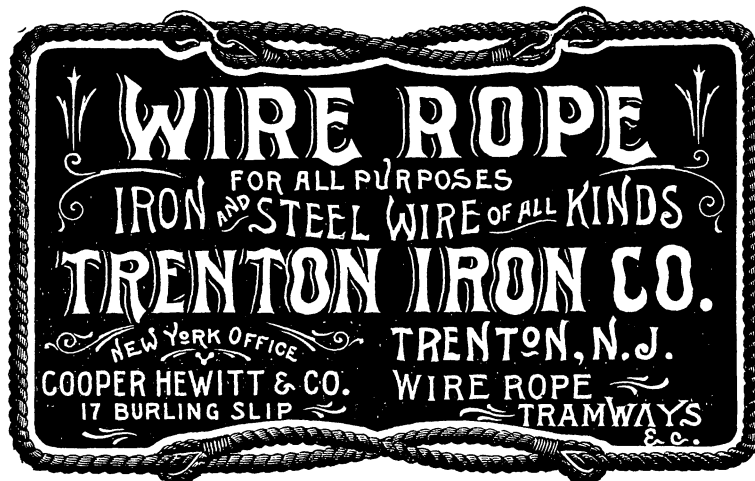
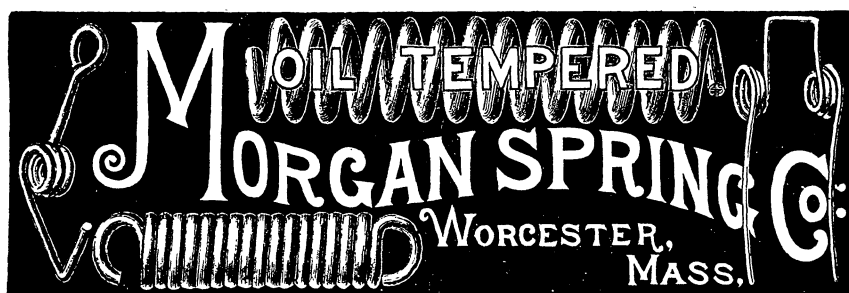
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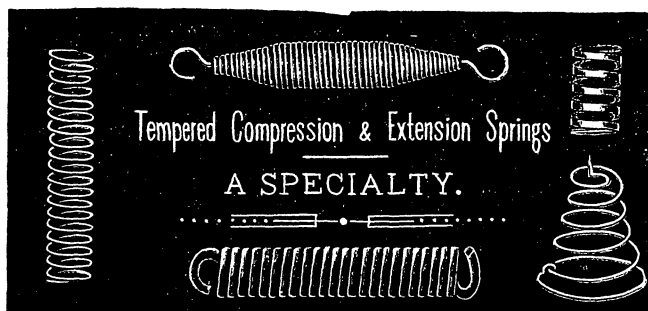
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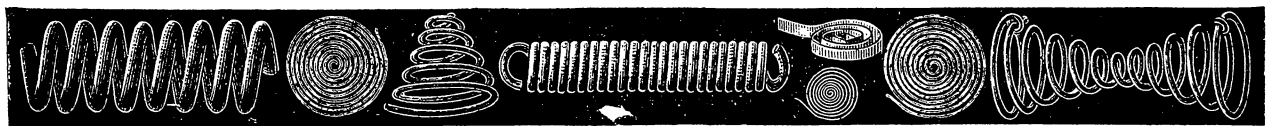
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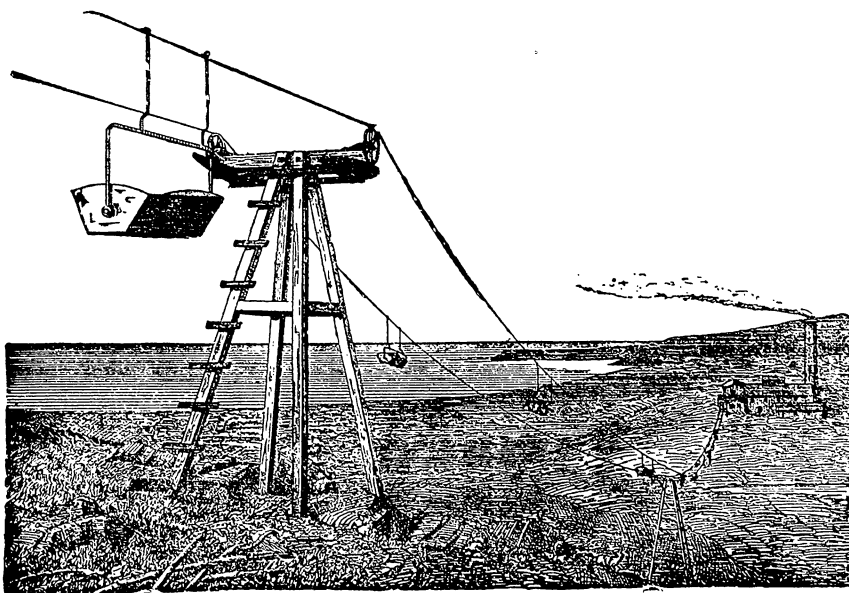
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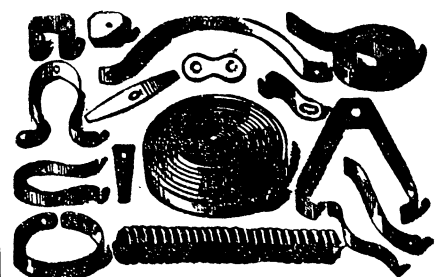
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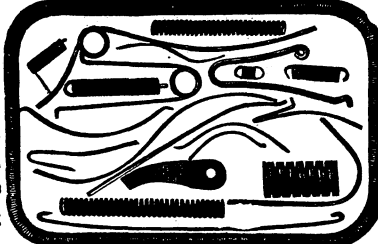
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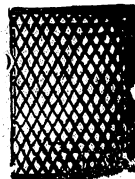


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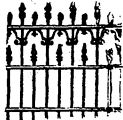


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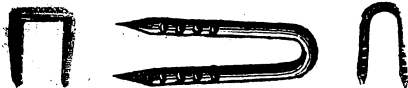
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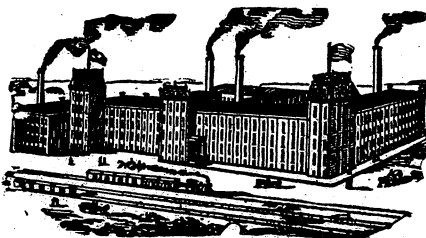
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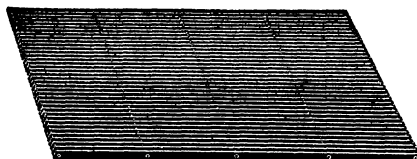
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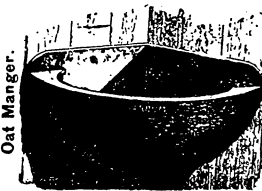
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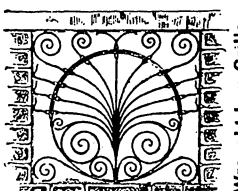
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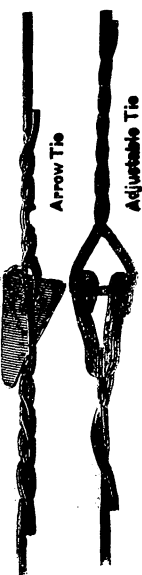
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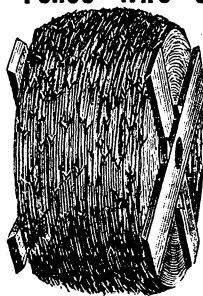
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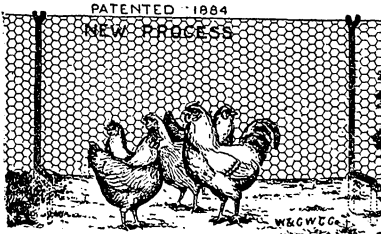
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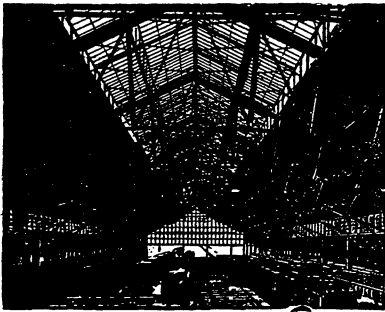
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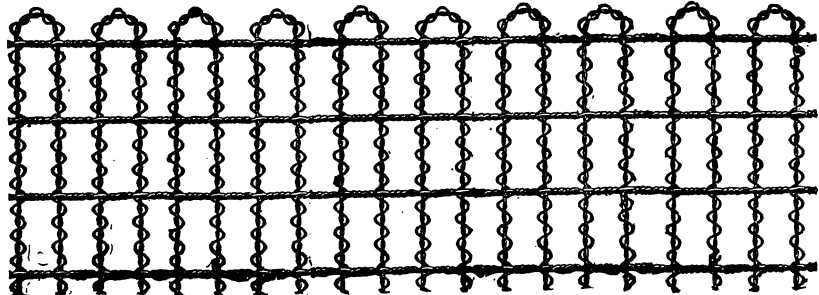
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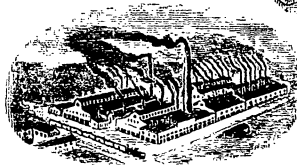
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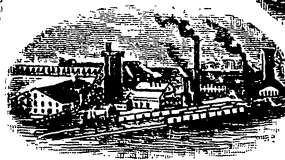
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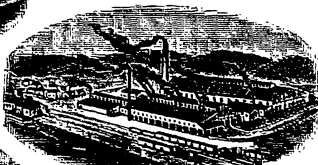
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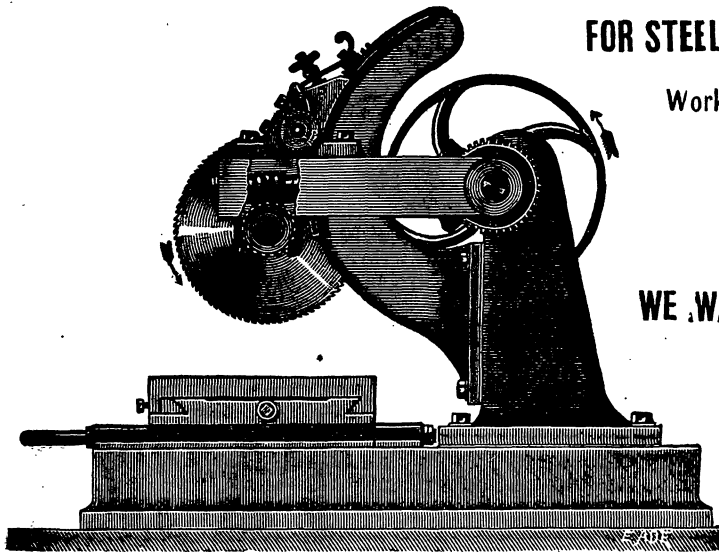
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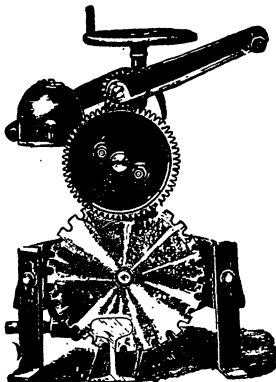
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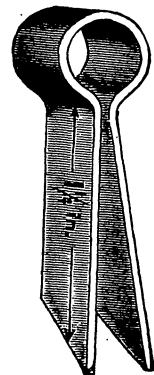
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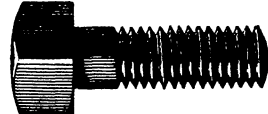
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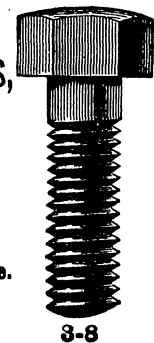
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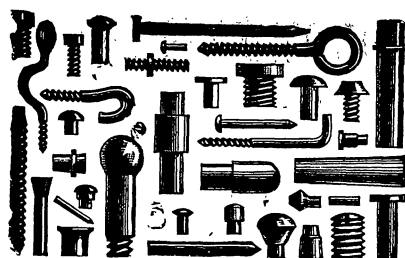


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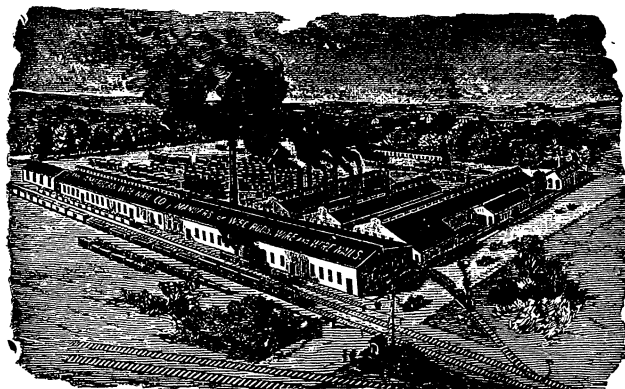


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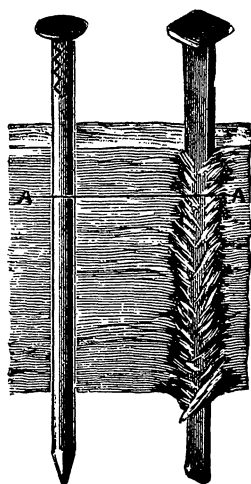
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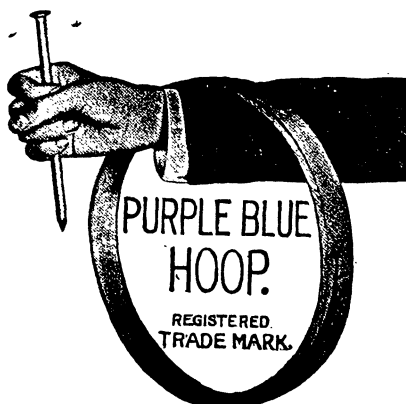
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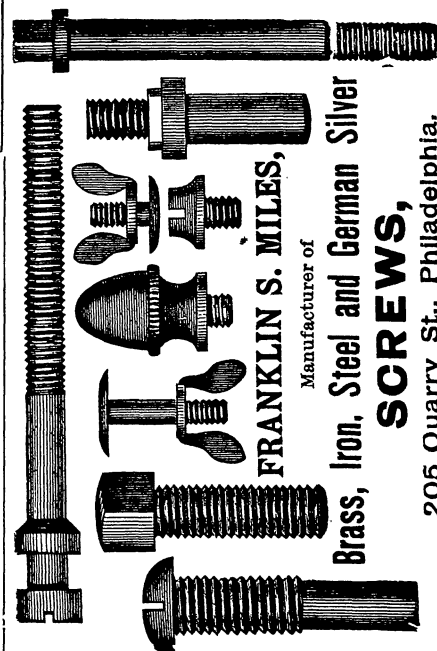
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Patented May 10, July 19, 1887; Oct. 29, 1889; Aug. 19, Oct. 21, 1890; April 7, May 12, 1891.

ITS ADVANTAGES ARE:

Stronger than a cut screw.

Forged nick.

Requires the use of only one bit.

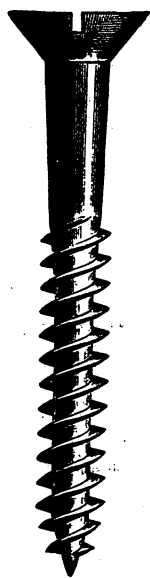
Inserted easier.

Increased holding power.

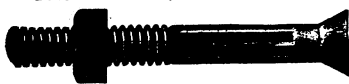
Centralized point.

Is cold forged, and entire surface has a metallic skin.

Samples Sent on Application.



Patented Nov. 11, 1890, Oct. 20, 1891.



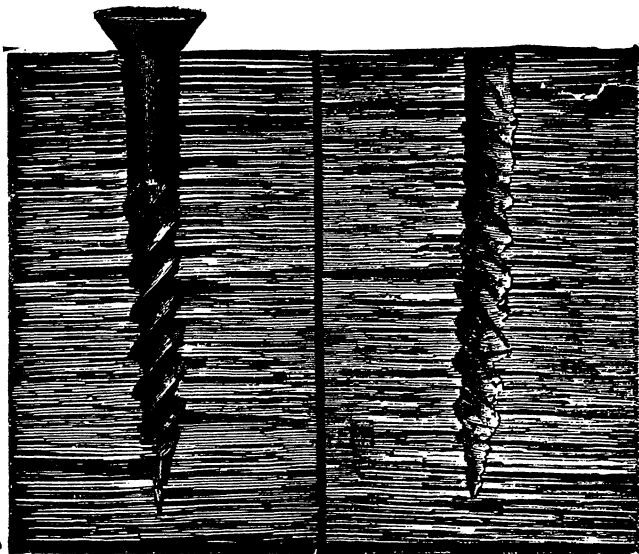
## FLUTED TIRE BOLTS.

SEND FOR SAMPLES.

## "ROGERS' DRIVE SCREWS."

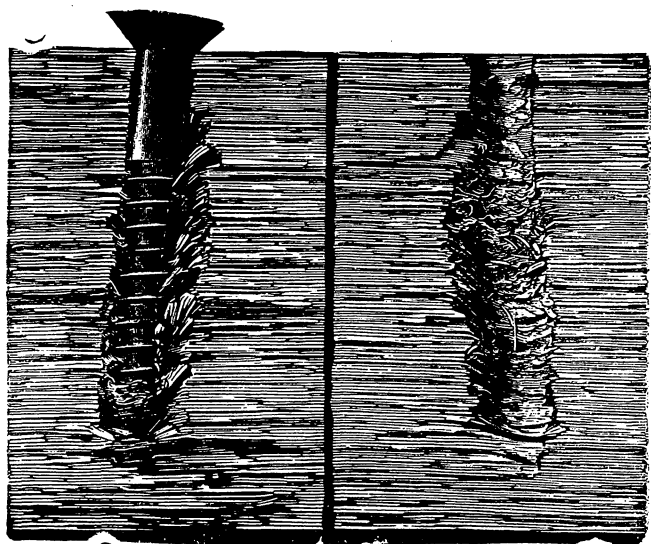
Patented May 10, 1887; July 19, 1887; July 10, 1888. Other patents pending.

List prices, same as common iron wood screws. Discount for Flat Heads, 82½%.



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Driven with a hammer its entire length.



A COMMON CUT THREAD SCREW,

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4. Cheaper than a common screw.
5. Is cold forged and has metallic skin over entire surface.

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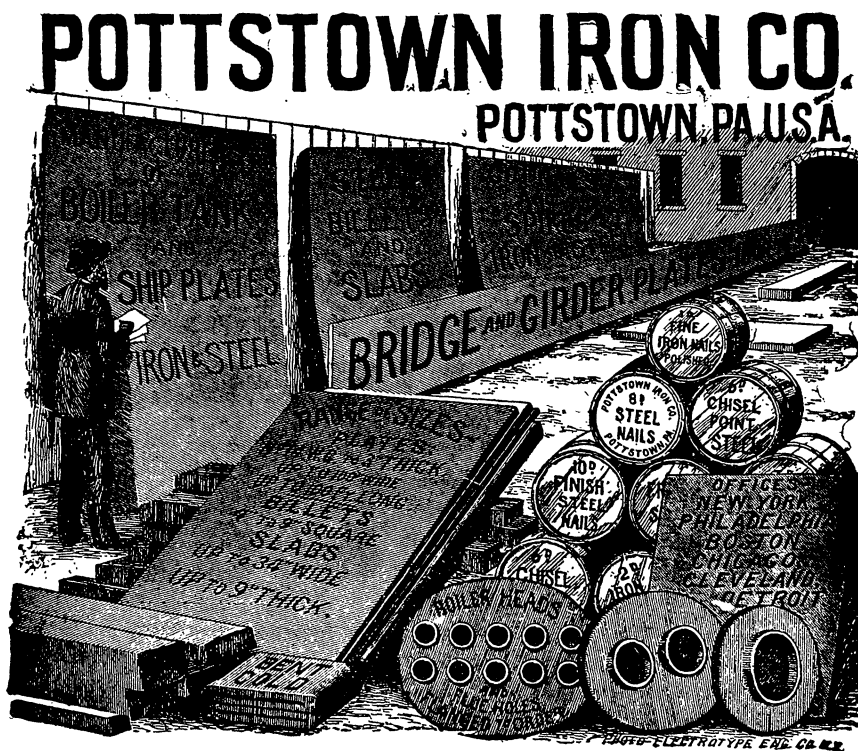
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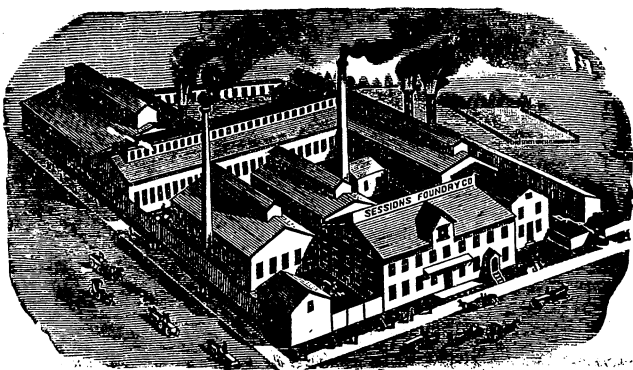
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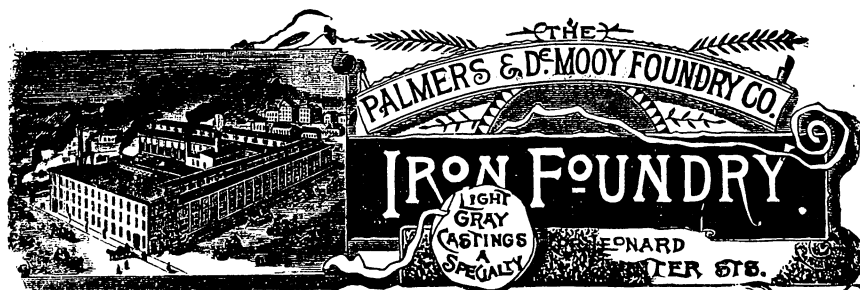
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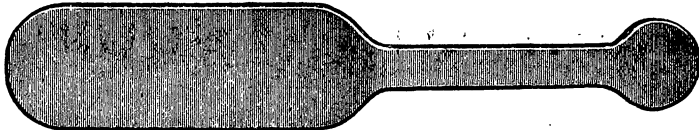
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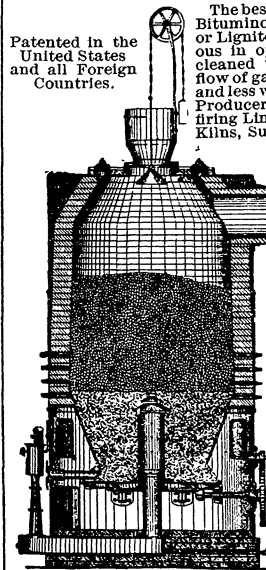
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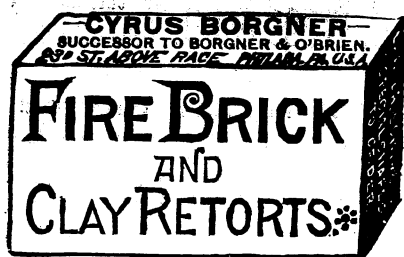
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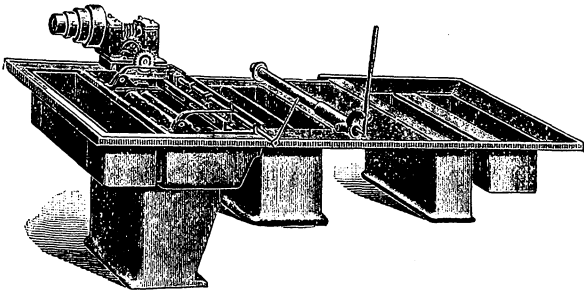
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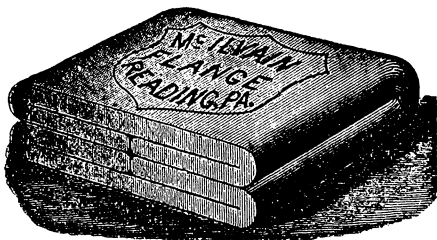
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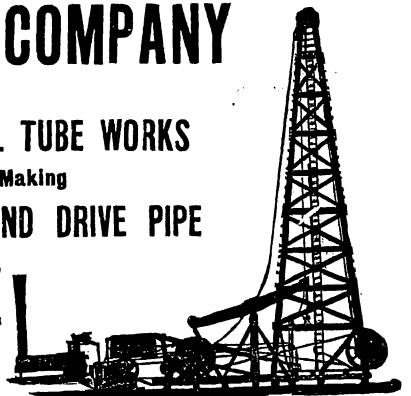
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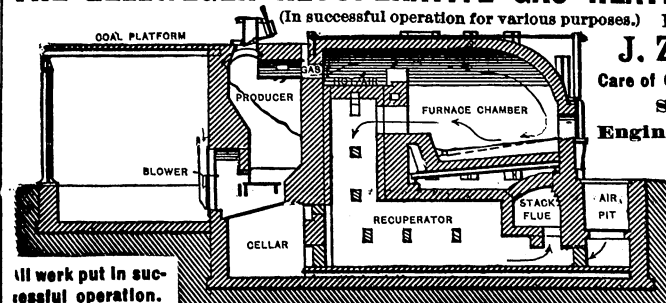
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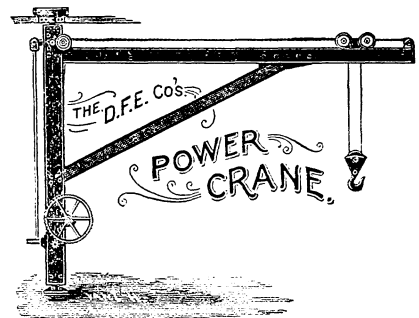
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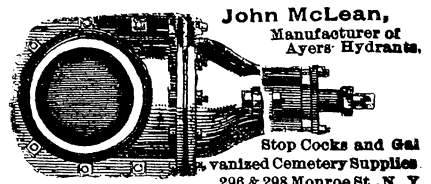
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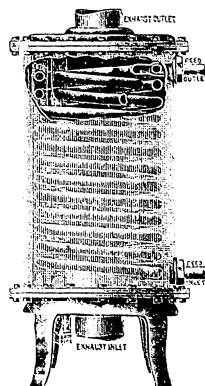
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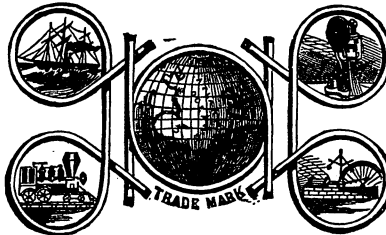
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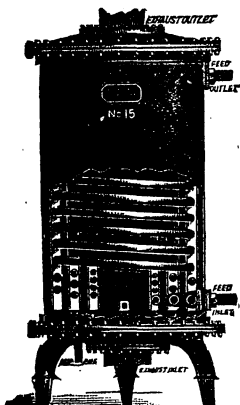


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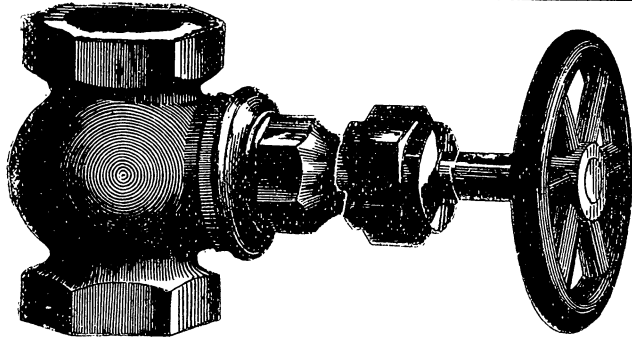
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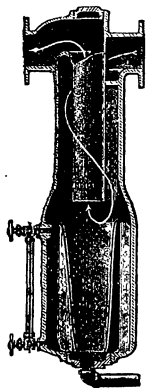
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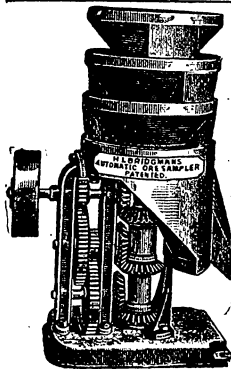
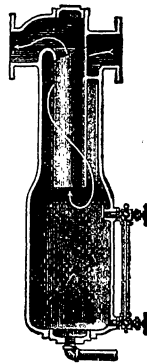


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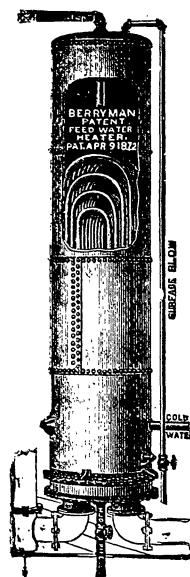
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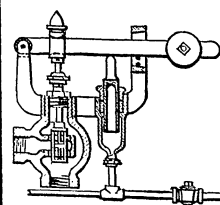
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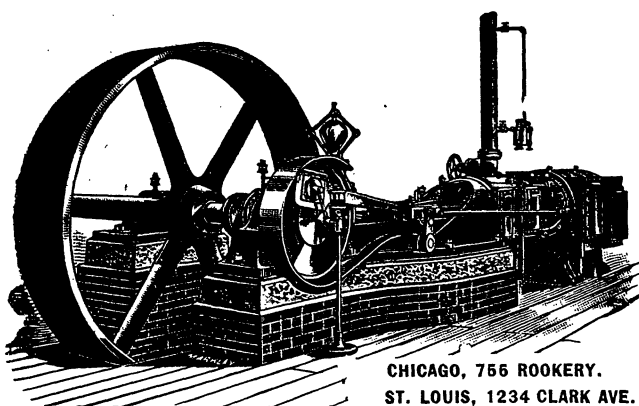
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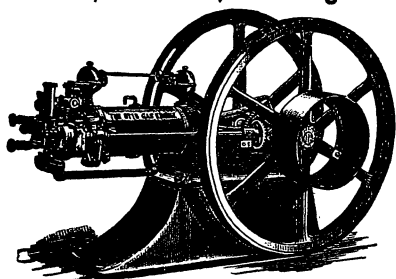
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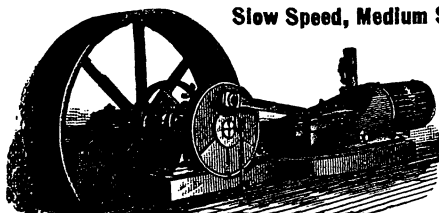
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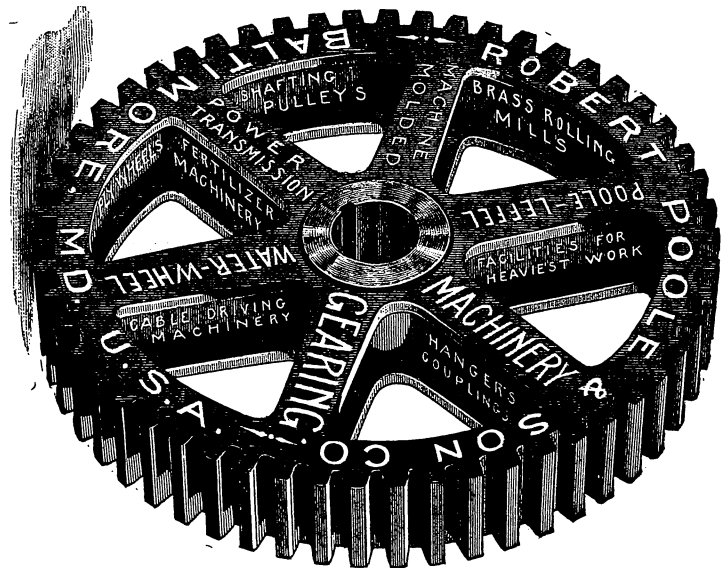
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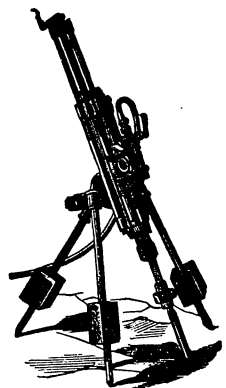
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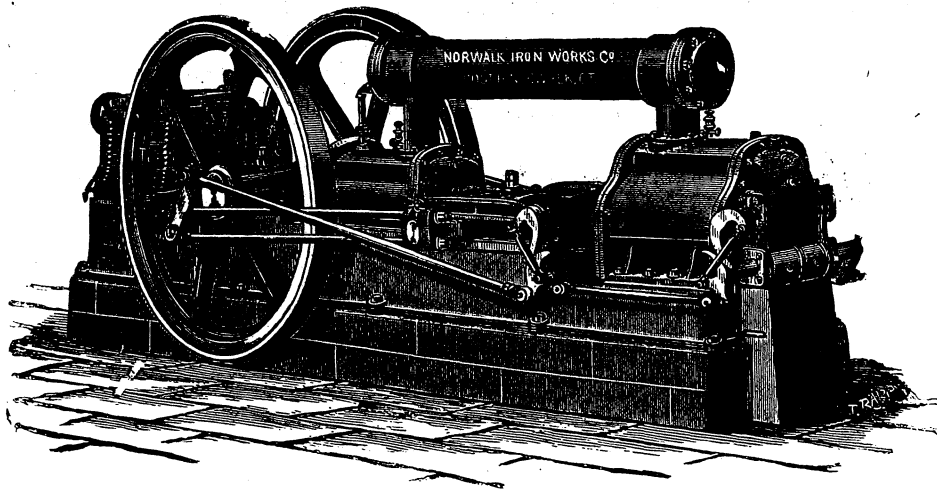
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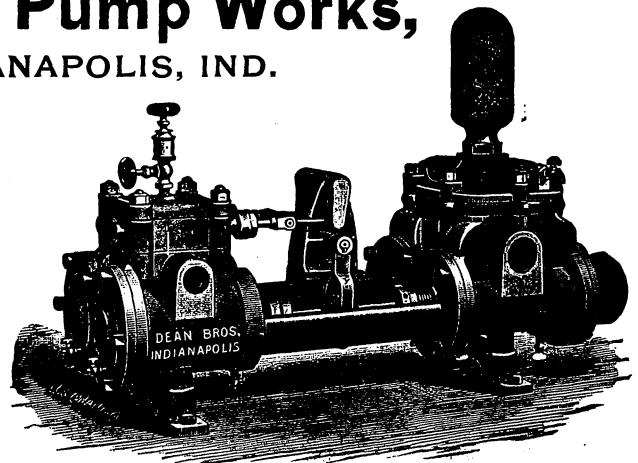
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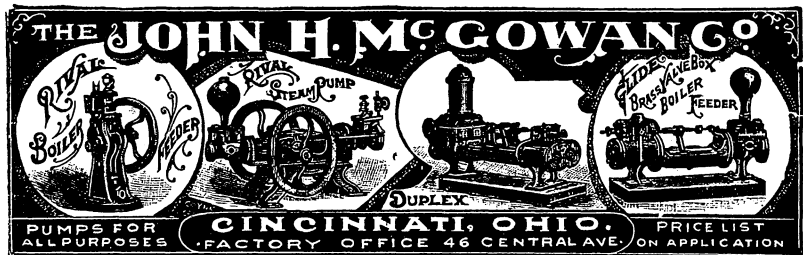
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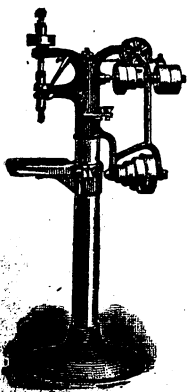
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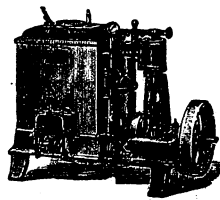
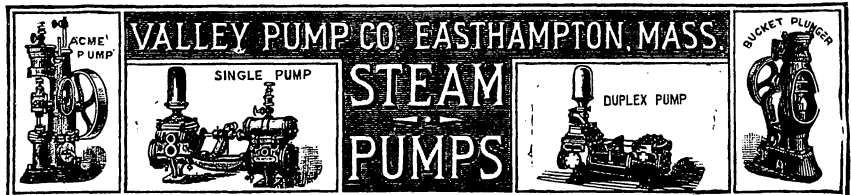


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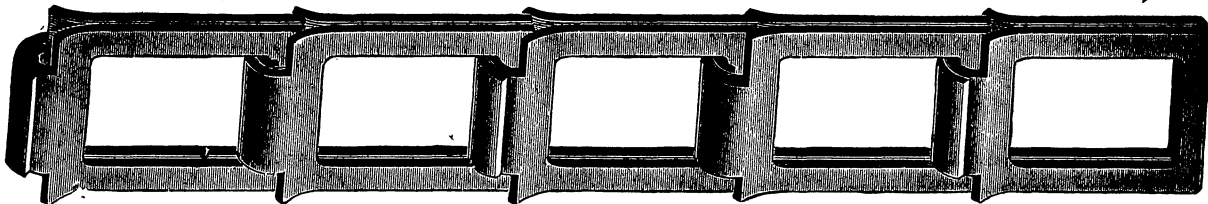
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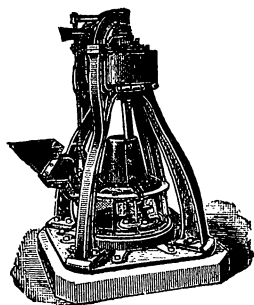
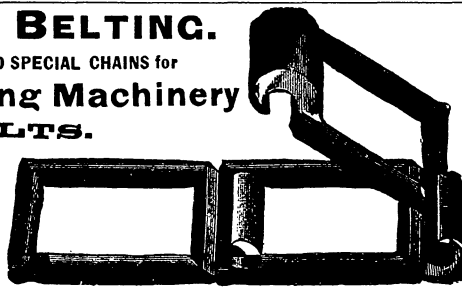
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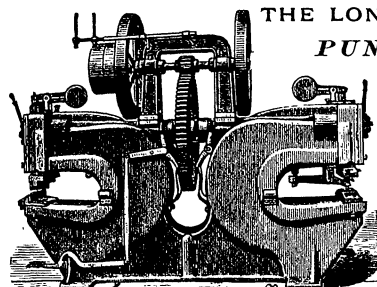
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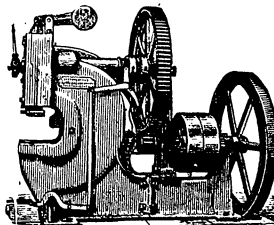
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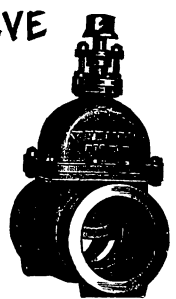
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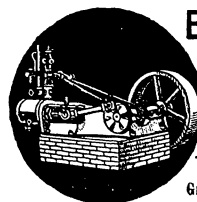
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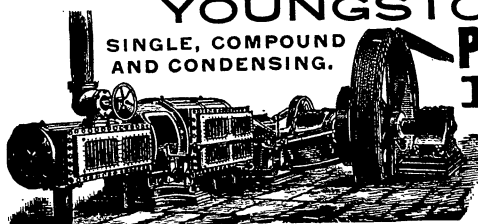
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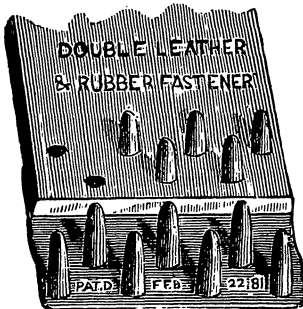
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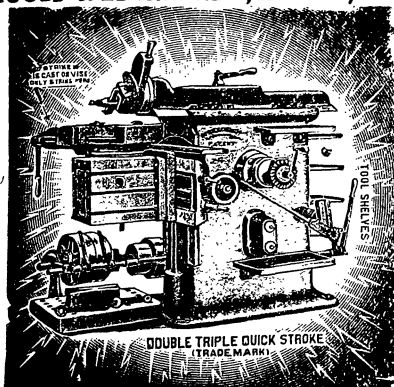
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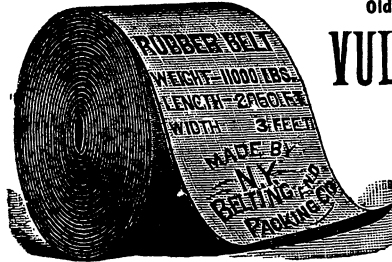
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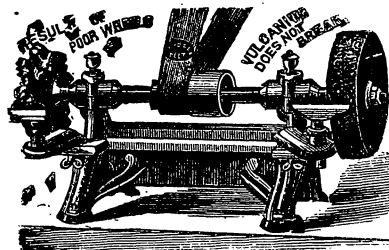
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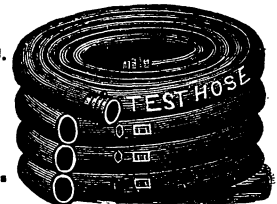
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By Prof. R. H. Thurston, for the purpose of correcting some misconceptions about the lubricating value of graphite.

FIRST TEST.	Quantity in milligrams.	Pressure on bearing per square inch.	Number of revolutions per minute.	Time in minutes till the bearings "squealed."	Total No. of feet friction surface traveled.
Best Sperm Oil.....	335.....	48 lb.....	2,000.....	11.....	7,198

#### Dixon's Perfected Graphite, mixed with enough water to distribute it over bearings....

120 .....48 " .....2,000.....30.....19,635

NOTE.—Under same number of pounds pressure and traveling at same rate of speed the graphite did nearly three times more work than the best quality of winter sperm oil.

SECOND TEST.	Quantity in milligrams.	Pressure on bearing per square inch.	Number of revolutions per minute.	Time in minutes till the bearings "squealed."	Total No. of feet friction surface traveled.
Best Sperm Oil.....	335.....	60 lb.....	2,000.....	51.....	33,360
Best Quality of Lubricating Grease	335.....	60 ".....	2,000.....	51.....	33,360
Same Grease containing 15% Dixon's Perfected Graphite	335.....	60 ".....	2,000.....	293.....	194,941

NOTE.—The grease without the graphite gave no better results than the sperm oil; but when 15%, by weight, of Dixon's Perfected Graphite was added the bearings were run nearly six times longer at the same high rate of speed. Furthermore, where the graphite was used there was no cutting and the bearings were in perfect condition.

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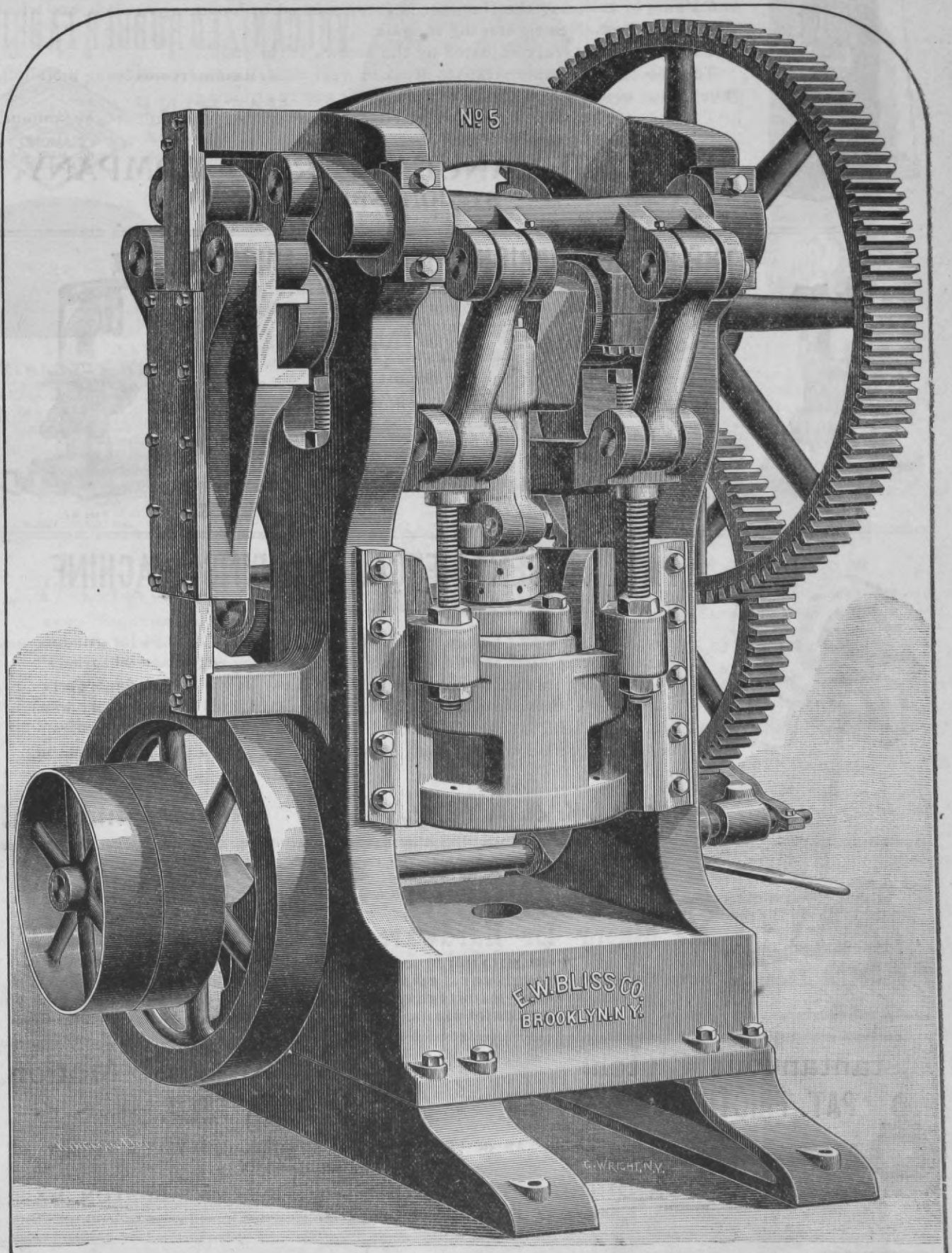
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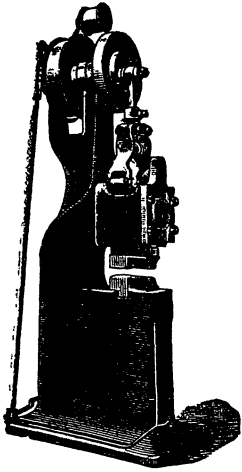
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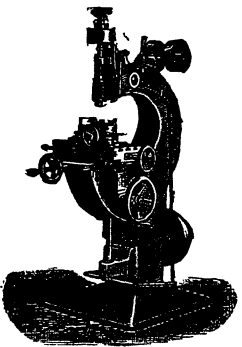
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Have a remarkable range of utility and are more indispensable than common horizontal millers.



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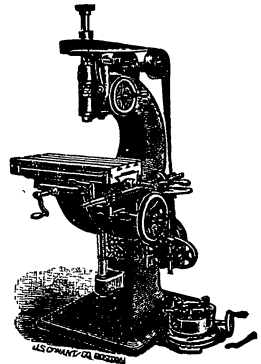
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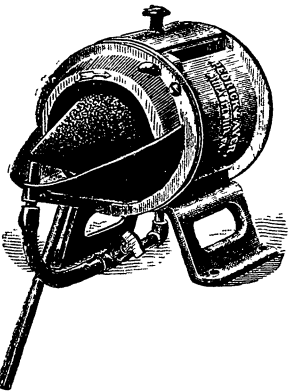
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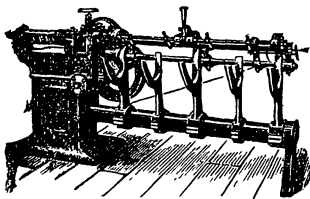
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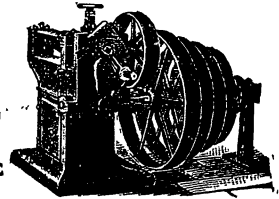
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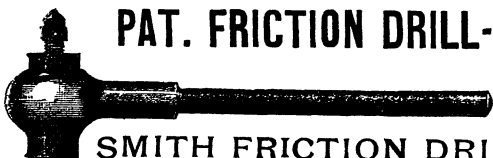
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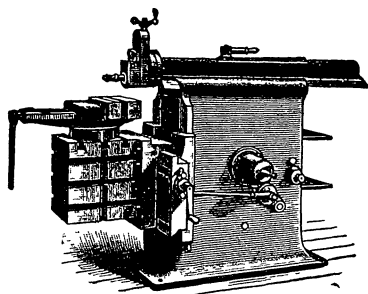


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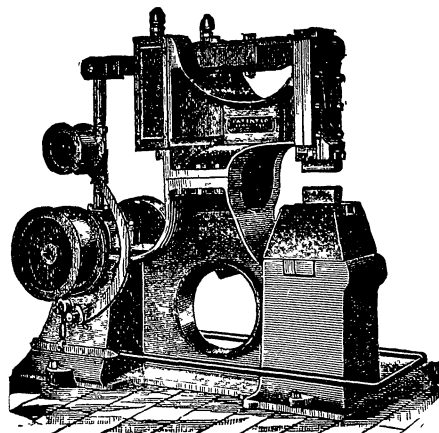
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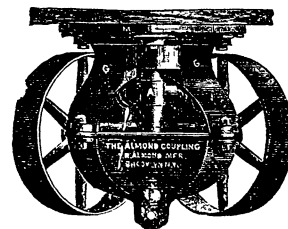
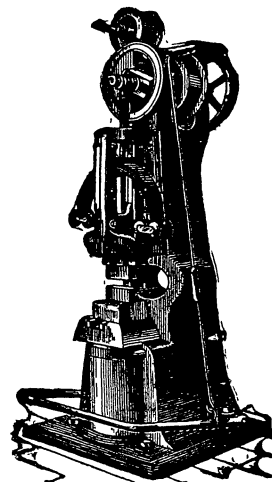
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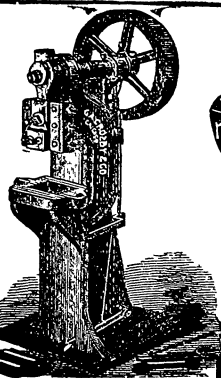


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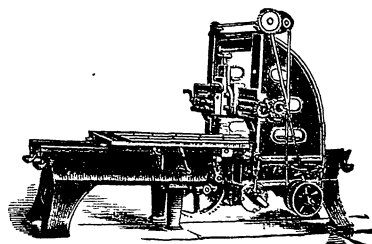
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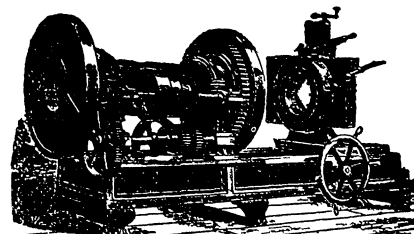
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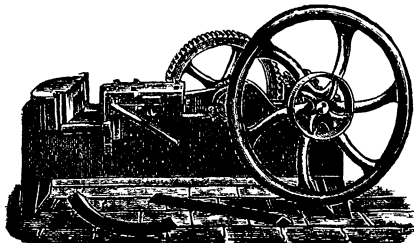
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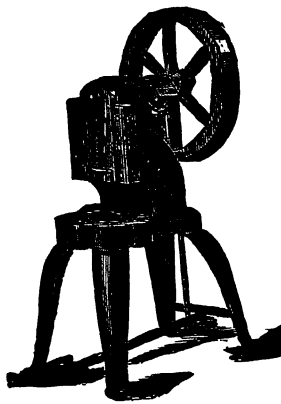
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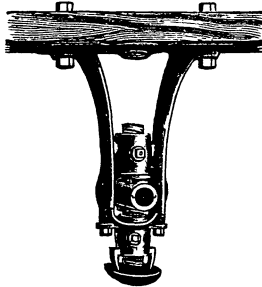
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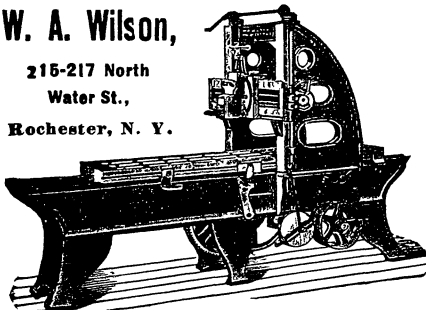
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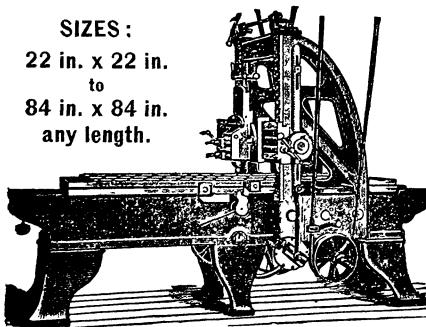
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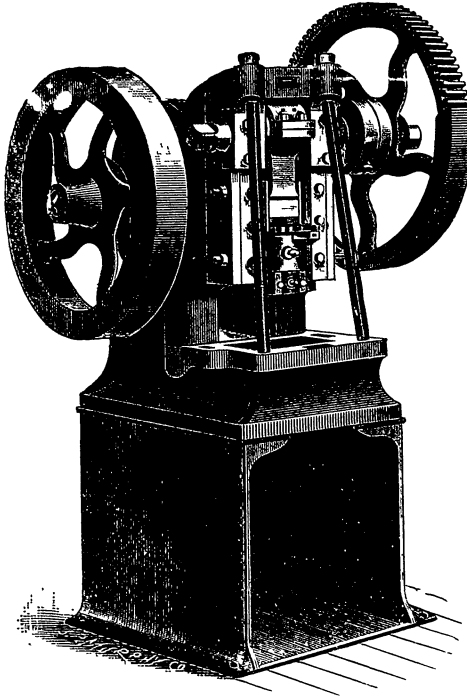
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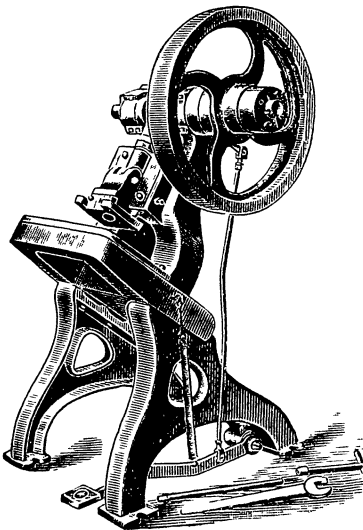
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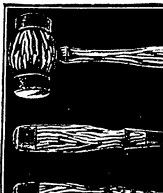
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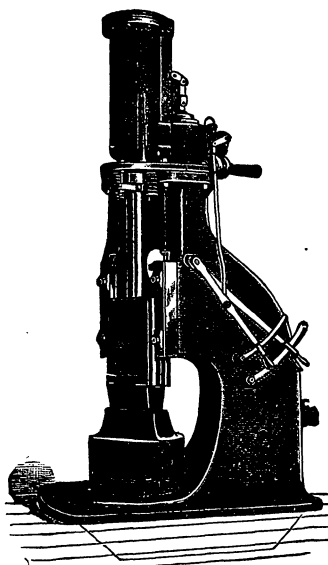
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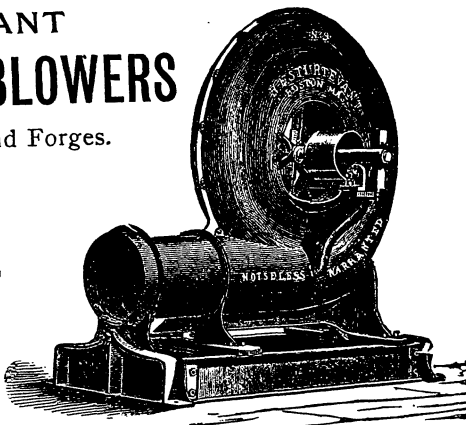
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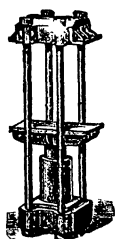


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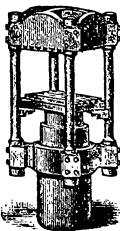
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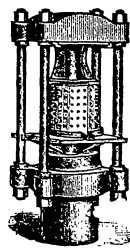
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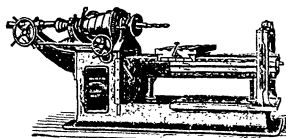
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Machine.

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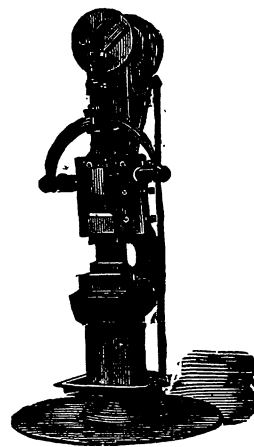
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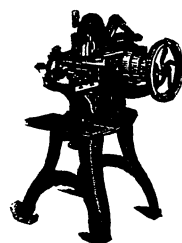


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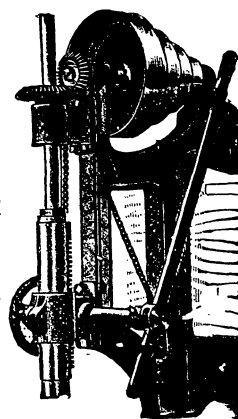
CHAS. CHURCHILL & Co.,

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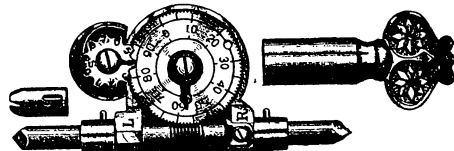
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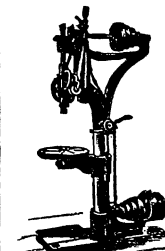
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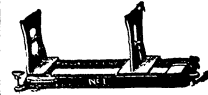
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FOR  
Substantial, Well Made.  
Low Priced, Patented  
**20 Inch Drills,**  
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Lever, Combination or Wheel  
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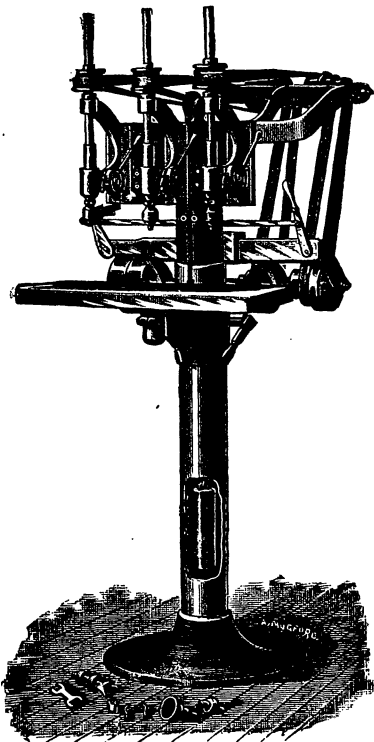
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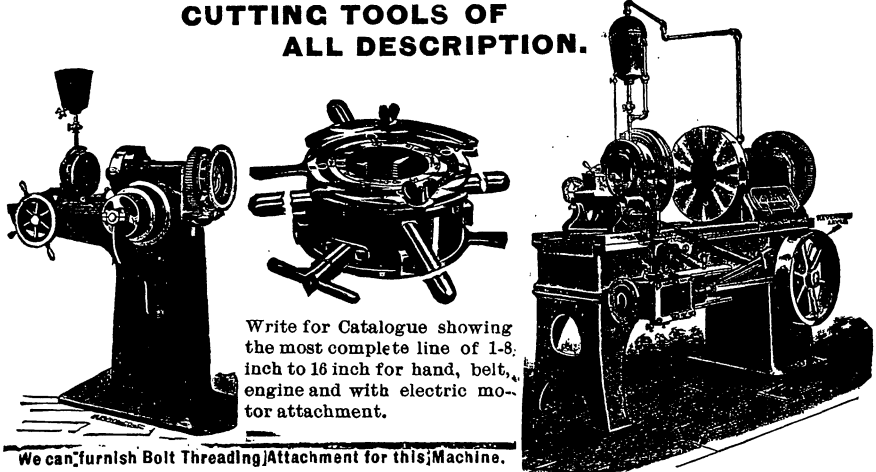
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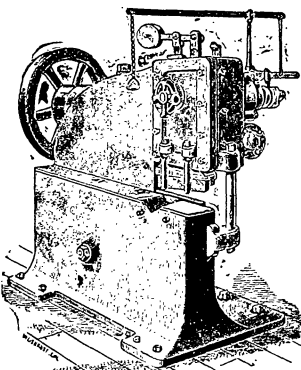
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Write for Catalogue showing  
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We can furnish Bolt Threading Attachment for this Machine.

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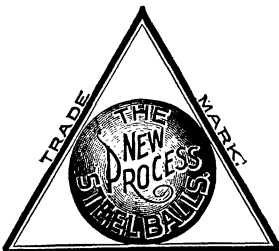
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For all purposes, from Bicycles to the  
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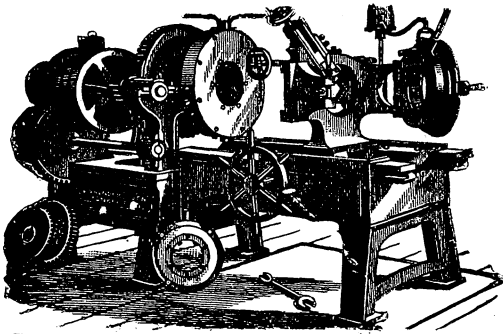
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For Pipe-Mill and Steam Fitters' Use. Tapping Machines for Steam Fitting. Also Steam and Gas Fitters' Hand Tools.

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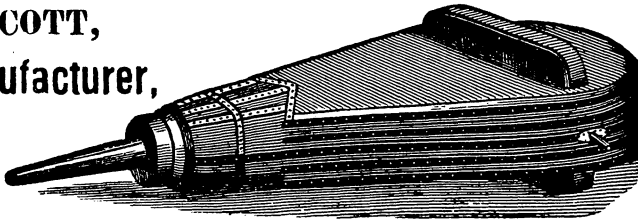
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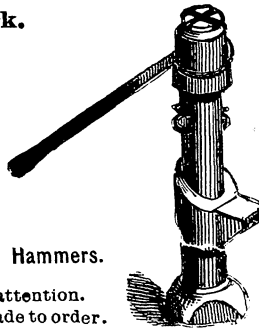
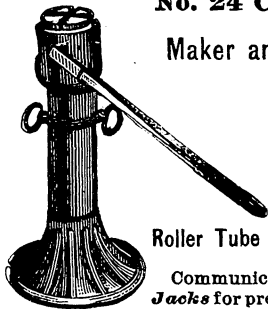


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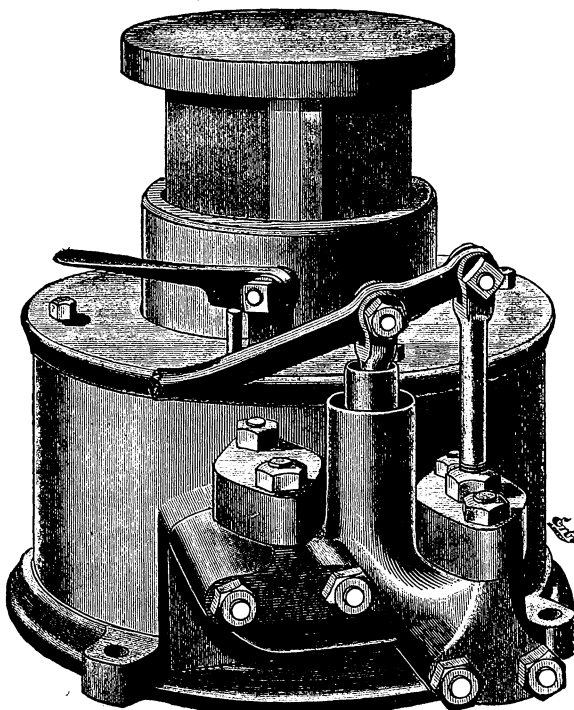
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For pressing Boxes into Hubs, and for pressing on Hub Bands for Farm and Freight Wagons.

It will raise 6 inches. Weighs 490 pounds. Can be operated by Hand or Power. Write for particulars and prices



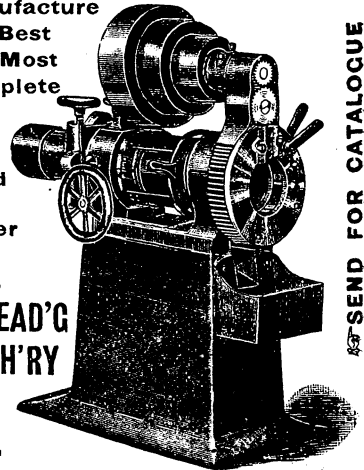
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Manufacture  
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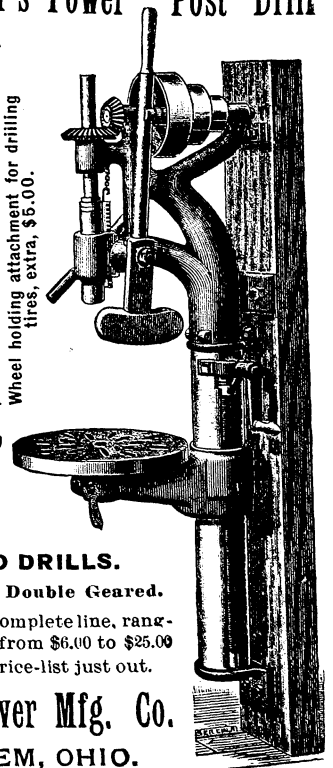
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## Silver's Power Post Drill

FIG. 727.

Has CUT GEARS, and is a thoroughly first-class tool in all respects. 1/4 in. Column, 1/2 in. Dia. Spindle, 1 3/16 in.; and bored No. 2 Morse Taper; Vertical Travel, 6 in.; Drills to centre 19 in. circle.

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Wheel holding attachment for drilling tires, extra, \$5.00.



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Single and Double Geared.

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Lever Blacksmith Forge**  
Largest Blacksmith Forge in America

Fan 16 inches in diameter with a five inch outlet, Hearth 32 by 45 inches. Provided with our Patent Sloped Bottom Coal Box, which holds one-half bushel. This Slope Bottom Coal Box in connection with the enormous size of Fan and Hearth, makes this Forge the greatest tool in America for the Blacksmith for quick and easy work.



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Weight, 120 Pounds.

Drills from 0 to 1 1/2 inch hole and to centre on a 15-inch circle. The Crank has Two True and Honest Speeds that can be shifted from shaft A to shaft B (or balance wheel shaft), precisely like all high-grade and high-priced drills, and not a blindfold imitation of a double speed drill made with a wooden handle riveted on the rim of the fly wheel, at a cost of just 1 1/2 cents, and necessitating the blacksmith to have a helper, or turn the drill with the Left Hand, as one man operating must face the drill to do the work, giving one hand for motion and the other for oiling and handling the work. By referring to illustration it will be seen that the Gears on this Drill are all provided with Two Journal Bearings, one on each side, this being the most important feature to make a drill strong and powerful, and just where all cheap-made Drills are weak, as their main driving gear revolves on a simple stud, cheaply screwed into the weakest part of the backbone, which is not only cheap and flimsy in construction, but not practical, which none know better than the intelligent mechanic. Our Catalogue illustrates Five Heavier Drills equally as cheap as the above.



**Champion 1890 Lever Blower**  
Guaranteed King of all Blowers.

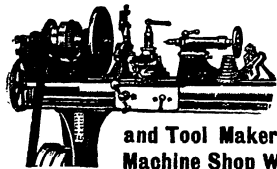
The 1890 is the only Double Geared Blower made. It will produce one-third more blast with 20 strokes per minute, than any other Lever Blower will produce with 30 strokes per minute, a labor saving of 600 strokes per hour, or 6000 strokes per day of 10 hours steady work. It works easy and noiseless. At a trial test a little girl six years old easily furnished the blast to put a welding heat on a 4-inch iron. Dimensions of 1890 Blower: Fan, 16 inches; Wheel, 25 inches in diameter.

All our Champion Lever Blowers and Forges are supplied with our World Renowned Champion Lever Motion with a record of eight years' constant use, and without a single repair to our knowledge, and is now on more than 55,000 Blowers and Forges in every day use.

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## FOOT POWER LATHES.



For Electrical and Experimental work. For Gunsmiths and Tool Makers. For General Machine Shop Work.

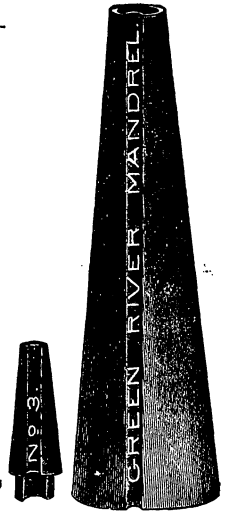
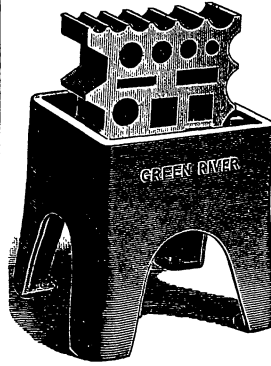
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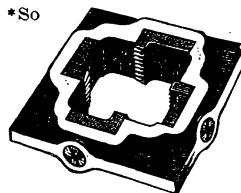
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A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;  
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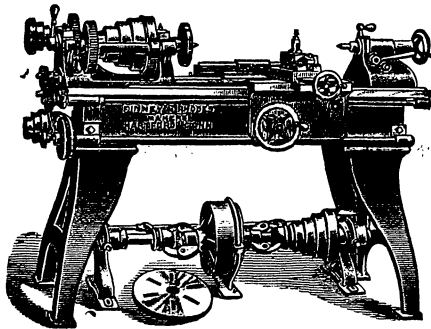
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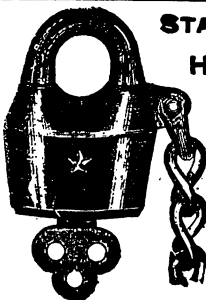
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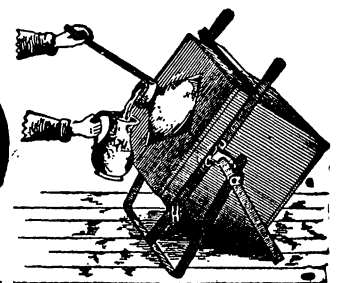
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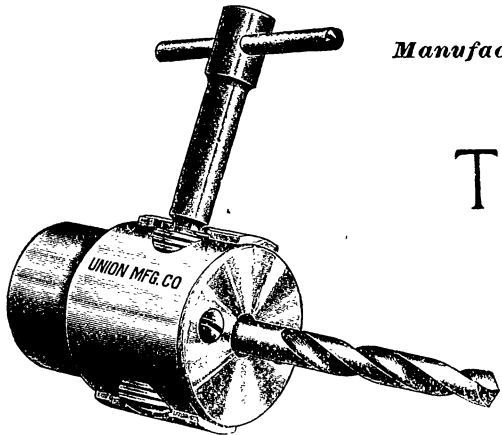
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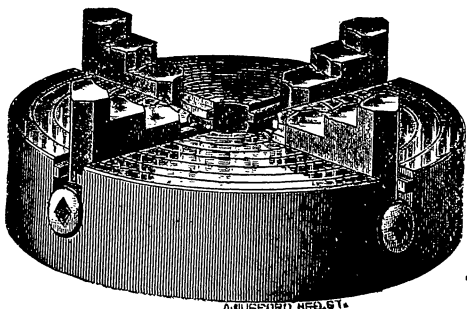


Manufacturers of Combination, Universal, Independent, and Combination Reversible Jaw Chucks.

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100	2 1/4 inches.	0 to 1/2 inch.	\$8.00
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102	3 1/2 "	0 to 1 inch.	10.00

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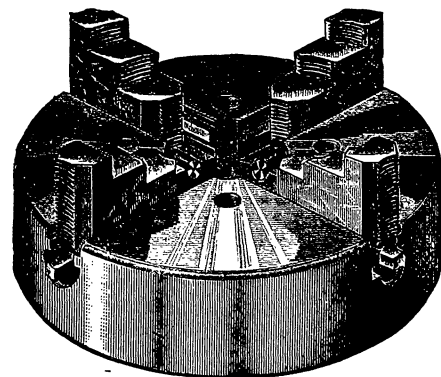


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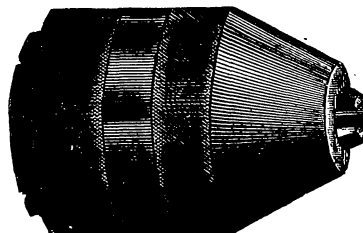
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THE NEW GIANT DRILL CHUCK.  
Holds a Drill With the Grip of a Giant. All Steel.

Parts Interchangeable,  
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EASY TO TAKE APART AND CLEAN. BEST OF WORKMAN-  
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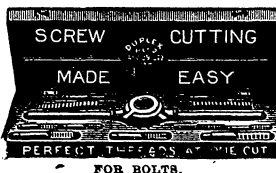


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15,000 now in use.

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PERFECT THREADS AT THE CUT  
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Also DRILL CHUCKS.  
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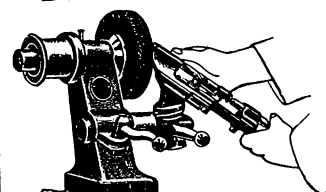
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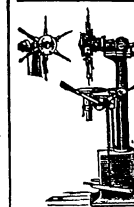
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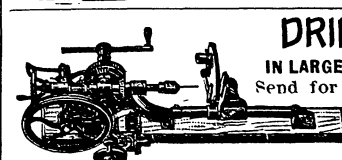
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Drills from 1-32 to 1/4 hole. Speed  
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Suitable for a large variety of  
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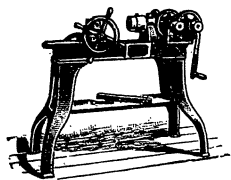
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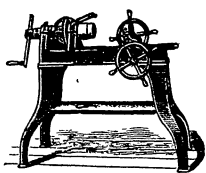
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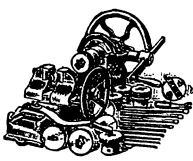
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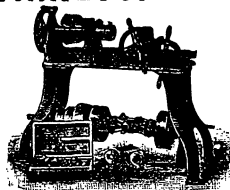
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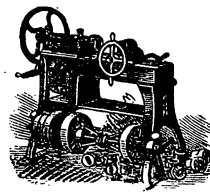
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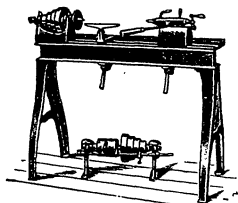
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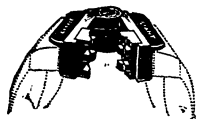
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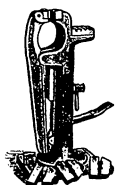
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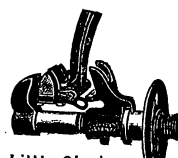
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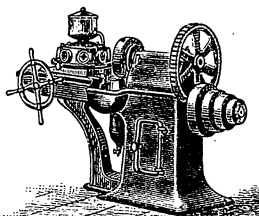
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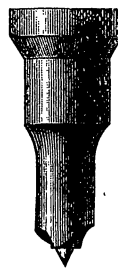
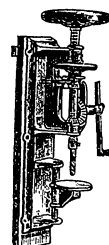
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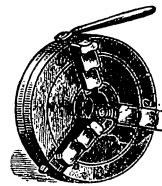
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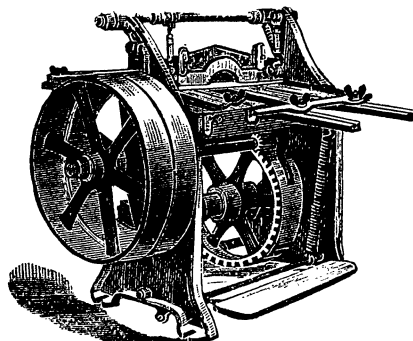


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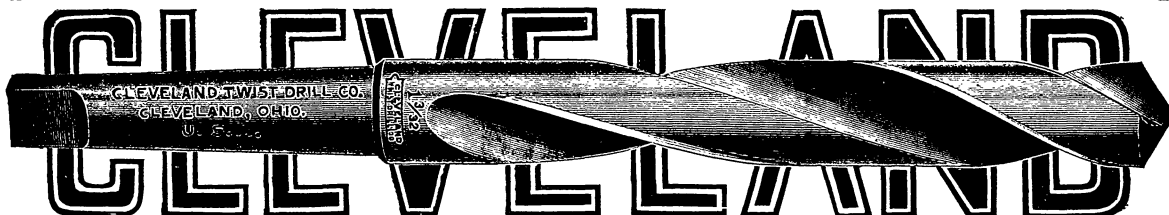
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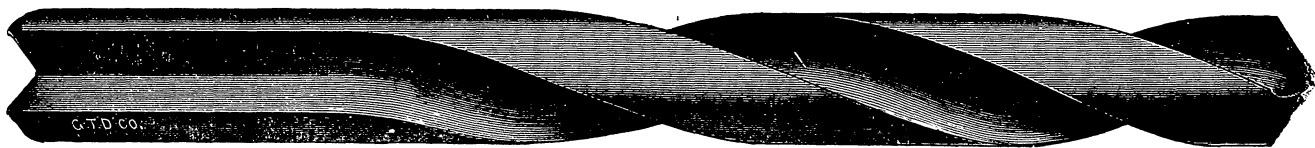
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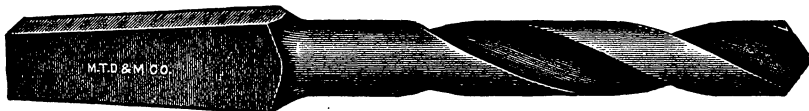
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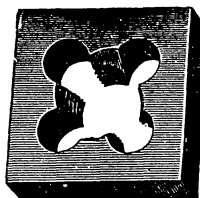
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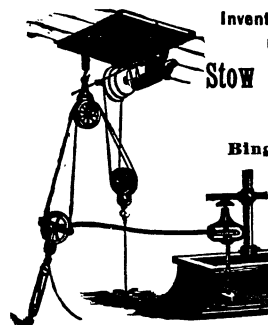
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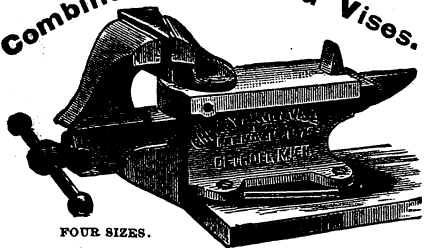
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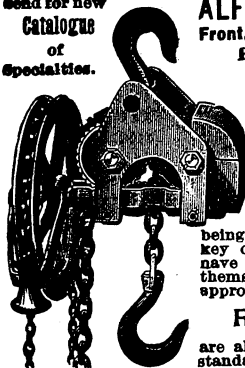
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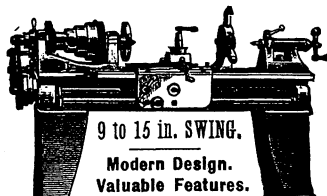
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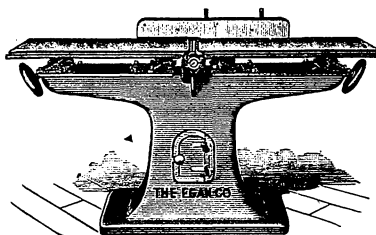
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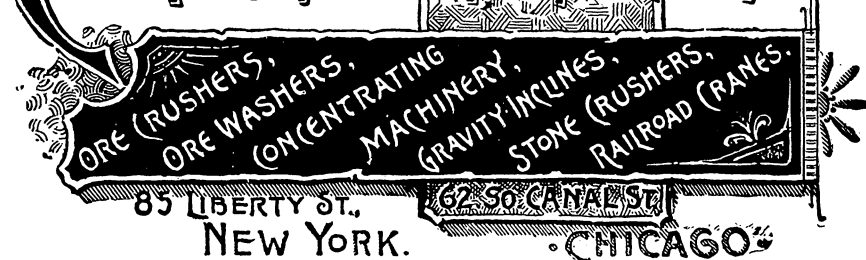
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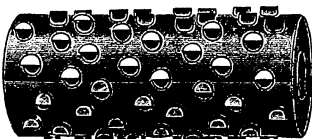
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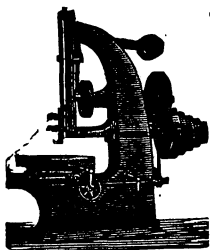
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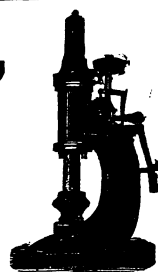
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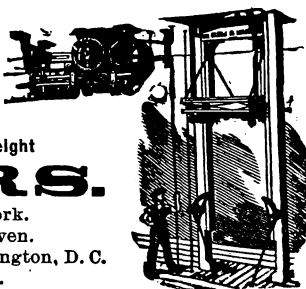
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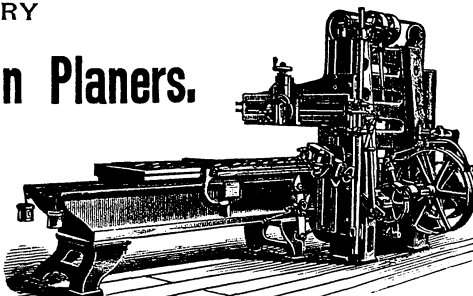
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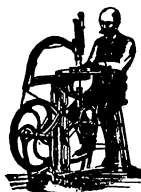
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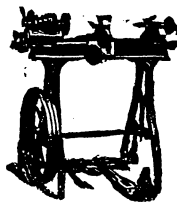
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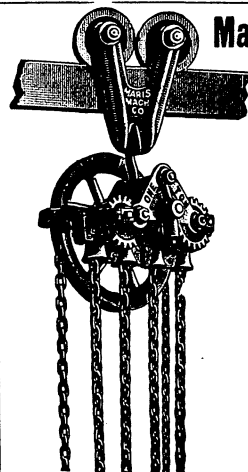
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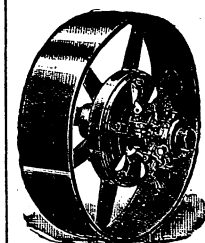
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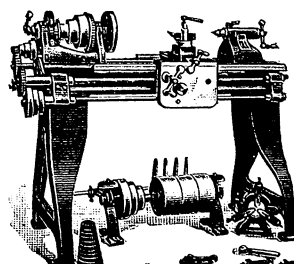
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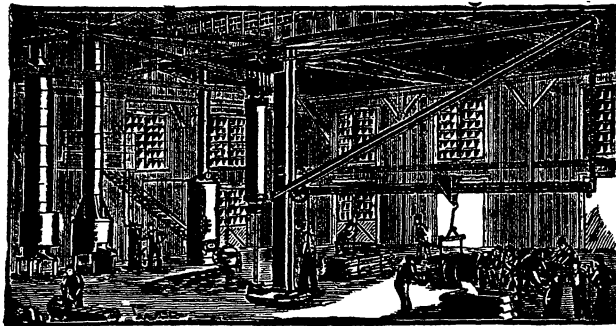
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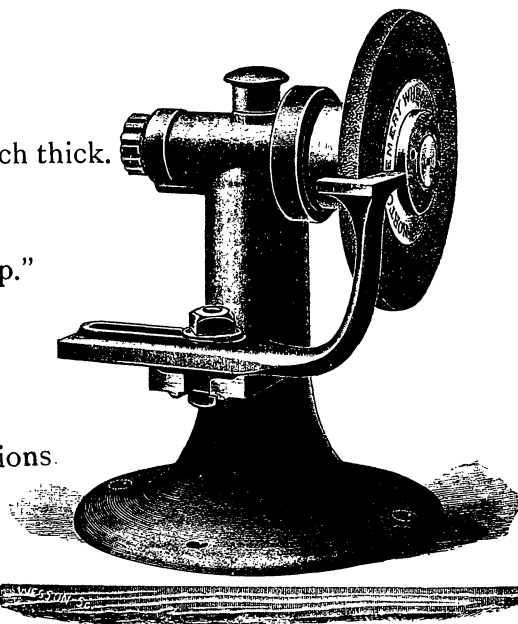
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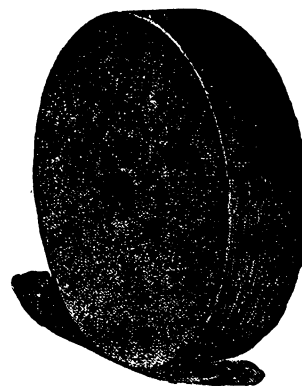
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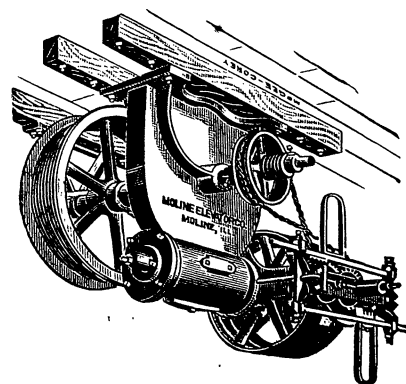


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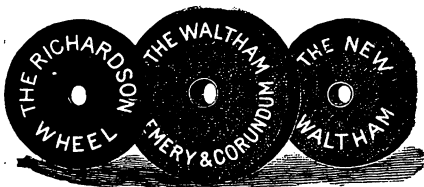
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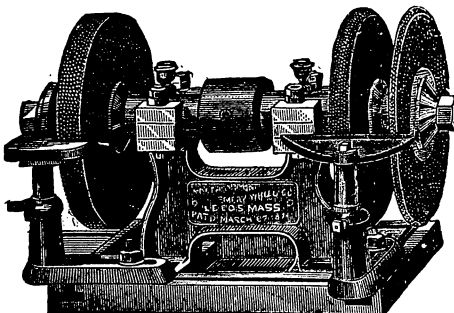
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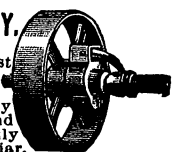


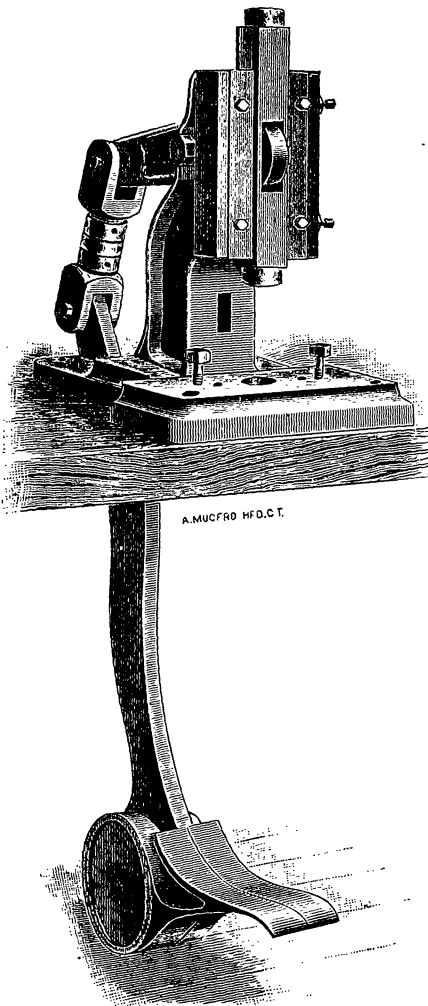
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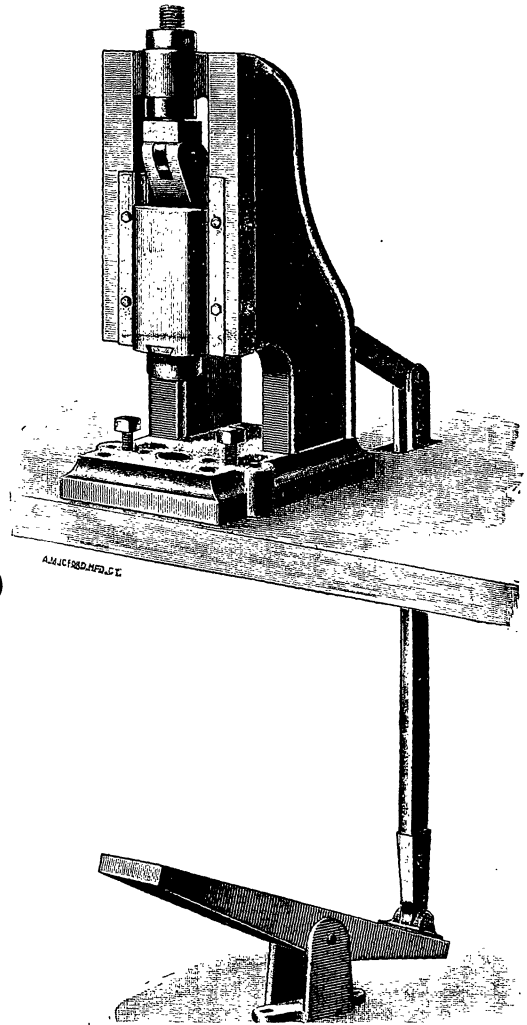
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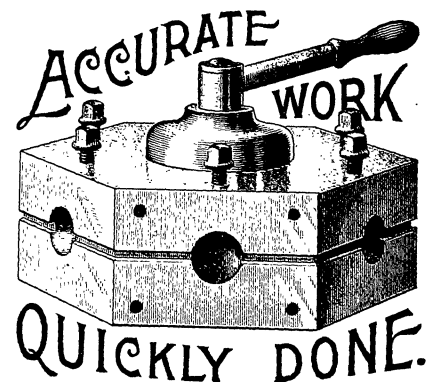
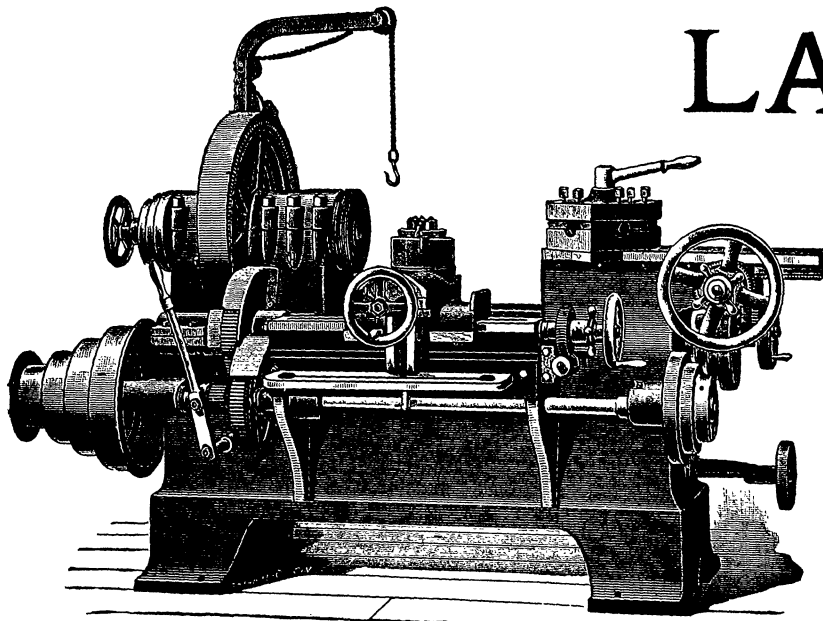
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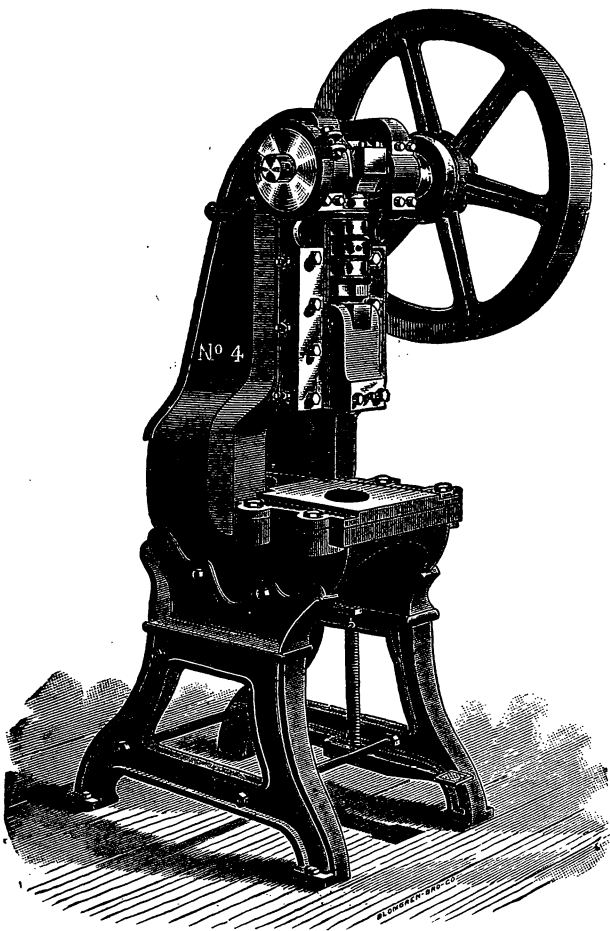


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Machine Tool  
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Immediate Delivery on Lathes from 16  
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## IMPROVED POWER PRESSES.

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## CHEAP SECOND-HAND TOOLS,

In Good Working Order.  
Mostly of Modern Design.

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- 1 20 x 6 New Haven "
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- 1 32 x 32 x 8 "
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Of Modern Style. In First-Class Order.

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- Radial Drill, 6 ft. arm, complete. Fitchburg.

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- 1 Planer, planes 5 ft. 24 in. x 24 in.
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- 1 Engine Lathe, 16 ft. bed, 84 in. swing, for Boring and Turning.
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- 17 in. x 8 ft. Engine Lathe, screw front, double T rest, milling attachment.
- 17 1/2 in. x 4 ft. Engine Lathe, screw back, double T rest.
- 17 1/2 in. x 8 ft. Engine Lathe, screw front, elevating block.
- 17 1/2 in. x 8 ft. Engine Lathe, screw front, double T rest.
- 18 in. x 6 in. Engine Lathe, screw and rod front, plain rest.
- 20 in. x 7 ft. Engine Lathe, no screw, plain block.
- 21 1/2 in. x 10 ft. Engine Lathe, screw front, double T rest.
- 22 in. x 10 ft. Engine Lathe, screw back, double T rest cross feed.
- 22 in. x 14 ft. Engine Lathe, screw front, double T rest.
- 25 in. x 14 ft. Engine Lathe, screw front, compound rest.
- 35 in. x 14 ft. Engine Lathe, screw front, compound rest.
- 24 in. x 8 ft. Chuck Lathe, turret head, seven 1 1/2 in. holes with 12 in. diam. 3-jaw combination chuck.
- 13 in. x 6 ft. Hand Lathe.
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- 16 in. x 8 ft. Hand Lathe.
- 20 in. x 12 ft. Hand Lathe.
- 20 in. x 16 ft. Hand Lathe.
- No. 1 Upright Drill.
- No. 1 Upright Drill.
- No. 2 Upright Drill.
- No. 3 Upright Drill.
- Radial Drill, 6 ft. arm, plain top table.
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- 48 in. x 48 in. x 12 ft. Planer.
- 42 in. x 42 in. x 20 ft. Planer.
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- No. 0 Shaper, with chuck and centers.
- No. 1 Shaper, with chuck and centers.
- 15 in. x 6 ft. Second-hand Engine Lathe, compound rest, "Blaisdell" make.
- 17 in. Stroke Second-hand "Jungst" Shaper.
- No. 1/2 Baker Pressure Blower, second hand.

## Also the following New Tools for sale at a Bargain.

- 12 x 5 Engine Lathe, double T rest, "Blaisdell" make.
- 12 x 6 Engine Lathe, double T rest, "Blaisdell" make.
- 14 x 5 Engine Lathe, double T rest, "Blaisdell" make.
- 14 x 6 Engine Lathe, double T rest, "Blaisdell" make.
- 15 x 6 Engine Lathe, compound rest, "Blaisdell" make.
- 15 x 6 Engine Lathe, plain rest, "Blaisdell" make.
- 16 x 6 Engine Lathe, plain rest, "Blaisdell" make.
- 16 x 8 Engine Lathe, compound rest, "Blaisdell" make.
- 17 x 6 Engine Lathe, compound rest, "Muller" make.
- 18 x 6 Engine Lathe, plain rest, "Blaisdell" make.
- 18 x 6 Engine Lathe, compound rest, "Blaisdell" make.
- 22 x 10 Engine Lathe, plain rest, "Blaisdell" make.
- 24 in. x 24 in. x 6 ft. Pon. planer.

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Successors to H. B. Smith Machine Co., Phila.

## FOR SALE.

- 4 Horizontal Tubular Boilers, 100 H.-P.
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- Horizontal Engines, automatic cut-off, from 50 to 300 H.-P.
- A large stock of Steam and Power Pumps, ready for immediate shipment.
- Write for prices.
- D. B. CRICKSHANK,
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## HOOKE-COLVILLE STEAM PUMP CO.,

30 W. Randolph St., 2d and Carr Sts.  
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- Porter Mfg. Co. Engine, 15 in. x 24 in. cylinder.
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- Atlas " 18 in. x 24 in.
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  - 1 24 in. x 24 ft. Forsaith. Compound Rest.
  - 1 24 in. x 10 ft. Forsaith. Complete.
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  - 1 21 in. x 12 ft. Dexter. Compound Rest.
  - 1 20 in. x 13 ft. Hubbard. Compound Rest.
  - 1 20 in. x 8 ft. Extra Heavy. First-class.
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  - 1 18 in. x 8 ft. Forsaith. Compound Rest.
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  - 1 16 in. x 8 ft. Porter. Complete.
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  - 1 14 in. x 6 ft. Sebastian-May.
  - 1 14 in. x 6 ft. Prentice. Complete.
  - 1 12 in. x 5 ft. Sebastian-May.
  - 2 10 in. x 4 ft. Reed. Complete.
  - 1 13 in. x 5 ft. Speed Lathe.
  - 4 10 in. x 4 ft. Speed Lathes.
  - 1 9 in. x 48 in. Star Lathe, Foot or Steam Power.
  - 1 9 in. x 54 in. Star, Foot or Steam Power.
  - 2 8 in. x 36 in. Foot Lathes.

- Planers.**
- 1 36 in. x 30 in. x 12 ft. Davis.
  - 2 30 in. x 30 in. x 8 ft. Davis.
  - 1 24 in. x 24 in. x 6 ft. Davis.

- Drills.**
- 6 32 in. Davis, B. G. & S. F.
  - 1 28 in. Blaisdell, B. G. & S. F.
  - 1 28 in. Snyder.
  - 15 25 in. Davis, B. G. & S. F.
  - 1 23 in. Blaisdell, B. G. & S. F.
  - 20 20 in. Davis, Standard.
  - 10 20 in. Davis, B. G.
  - 1 18 in. Bench Drill.
  - 2 12 in. Davis. Semi-Sensitive.
  - 3 Woodward & Rogers Semi-Sensitive.
  - 1 Barnes 3 Spindle.
  - 2 16 in. Sensitive. New. Cheap.

- Shapers.**
- 1 20 in. Juengst, Friction.
  - 1 20 in. " Crank.
  - 1 15 in. " Friction.
  - 1 15 in. " Crank.
  - 2 15 in. Davis Crank.
  - 1 12 in. Boynton & Plummer.

- Milling Machines.**
- 1 No. 4 1/2 Garvin.
  - 1 No. 3 Garvin.

- Cutting-off Machines.**
- 1 each 3 and 4 1/2 in. Davis.
- W. P. DAVIS,**  
Rochester, N. Y.  
Send for Complete List.

## DESIRABLE SECOND-HAND MACHINERY.

- LATHES.**
- 1 25 in. x 26 ft. L. W. Pond, Compound Rest, Rod Feed, Good order.
  - 1 17 in. x 8 ft. Blaisdell, Rise and Fall Rest. Good as new.
  - 1 17 in. x 6 ft. Blaisdell, Rise and Fall Rest. Good as new.
  - 1 16 in. x 7 ft., Bement, Plain Rest, heavy, fine Tool. A1 condition.

- PLANERS.**
- 1 30 in. x 30 in. x 8 ft. Hewes & Phillips, Spiral Geared, one Head on rail. Very fine, modern tool. Good as new.
  - 1 15 in. x 15 in. x 8 ft., Wilkinson. A1 condition.
  - 1 22 in. x 18 in. Blaisdell Crank Planer. Good as new.
  - 1 24 in. x 24 in. x 5 ft. Whitcomb Planer. Good order.

- MISCELLANEOUS.**
- 1 4-in. Hubbert & Rogers Cutting-off Machine. A1 condition.
  - 1 20-in. Prentice Bros. Drill, Wheel Feed, with Chuck Good order.
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  - 1 3-spindle Barnes Drill Press. Good as new.
  - 1 No. 1 2-spindle Garvin Drill. Good as new.
  - 1 No. 2 4-spindle Garvin Drill. Good as new.
  - 1 No. 3 4-spindle Garvin Drill. Good as new.
  - 1 No. 2 Brown & Sharpe Screw Machine, Automatic Chuck and Wire Feed. A1 condition.
  - 1 15 in. x 5 ft. Hendey Turret Lathe. Good order.
  - 1 15 in. x 5 ft. Jones & Lamson Turret Lathe, with 3-jaw Universal Chuck. Good as new.
  - 1 No. 2 Garvin Power Miller, Swivel Vise and Arbor. Good as new.
  - 1 No. 4 Garvin Miller, Arm, Vise and Arbor. A1 condition.

Nearly 500 other New and Second-hand Tools in stock. Write for list and prices

**THE GARVIN MACHINE CO.,**  
Laight and Canal Sts., New York, N. Y.

2 20 in. x 24 in. Ingersoll-Sergeant Straight-Line Improved Air Compressors, used comparatively short time, in excellent condition; ready for delivery.

1 24 in. x 60 in. Harris-Corliss Engine, left hand; fly wheel 18 ft. diam., 31-in. face; in good condition. To be replaced by compound; can be seen running. Delivery about May 1st.

For particulars apply to

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## Great Bargains.

Must be Sold and Removed.

16 in x 30 in. Horizontal Engine.

18 in. x 36 in. Horizontal Engine.

24 in. x 36 in. Horizontal Engine.

19 1/2 in. x 48 in. Beam Engine, with Knowles Condenser.

Write us for what you want.

**LOVEGROVE & CO.,**

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## SECOND-HAND MACHINERY.

One Putnam Planer, 26 in. x 26 in. x 8. Fine order.

One Car Axle Cutting off and Centering Machine.

One Pond Machine Tool Co. Iron Planer, 40 in. x 40 in. x 24 ft., with two heads. In fine order.

One Large Lathe, swings 78 inches over ways, and takes 9 feet between centers. Fine order.

One Ferris & Miles 500 lb. Steam Hammer.

One Belden 100-lb. Upright Power Hammer.

One each 60 lb. and 80 lb. Bradley Helve Hammers.

Send for circular of Second-hand Machinery in stock.

**HILL, CLARKE & CO.,**

156 Oliver St., Boston, Mass.  
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## LATHES IN STOCK:

16 x 8,  
18 x 8,  
21 x 10.

Hendey Make. Get price.

**THE SCRANTON SUPPLY AND MACHINERY CO.,**  
Scranton, Pa.

## SOME BARGAINS HERE.

- 1 32 x 32 x 9 New Haven Planer
- 1 Hendey Shaper, 15 in. stroke, imp. vise; new.
- 1 30 x 30 x 6 New Haven Planer
- 1 14 x 6 Screw Cutting Engine Lathe; new, \$50.
- 1 No. 5 Sturtevant Blower; good as new.
- 1 600-lb. Bement, Miles & Co. Steam Hammer.
- 1 24 x 6 W. Fifield Lathe; nearly new.
- 1 8 ft. high, 3 x 2 ft. bed Woolen Press.
- 1 15 H.-P. Westinghouse Water Tube Boiler

And other machinery, new and second hand. Write for prices.

**Machinists' Supply Company,**  
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## FOR SALE.

Centre and Side Bearing  
Steel Street Rails,

All fit to relay and in lots to suit. Apply to

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## MACHINERY,

NEW AND SECOND-HAND, FOR SALE.

- 90 in. swing, 30 ft. Bed, Screw Cutting, &c. Ames.
- 50 in. " 30 ft. " For Rolling Mill Forgings. New
- 30 in. " 28 ft. " Pond Mach. Tool Co. Shafting

**Lathes.** A1.

- 32 in. 12-14-16-18 ft. Beds. New.
- 28 in. 12-14-16-18 ft. " " "
- 24 in. 16, 20 and 24 ft. Bed. New.
- 21 in. 10 and 12 ft. Beds. New.
- 20 in. 7 1/2 and 8 ft. " Ames. Good.
- 18 in. 8 ft. " Several Makers.
- 16 in. 6 and 8 ft. " " "
- 15 in. 6 and 8 ft. " " "
- 14 in. 6 ft. " " "

- 15, 18 and 25 in. stroke Crank Shapers, Steptoe. New.
- 22, 26 and 30 in. " Geared " Good order.
- 9 in.-16 in. " Crank " " "
- 24 in. " Hendey " " "

- 20 in.-22-24-28-30-36 in. Drills. New and Second-hand.
- 24 in. x 4 ft.-5 ft.-6 ft. Planers.
- 26 in. x 6 ft. and 36 in. x 3 ft. Planer.
- 36 in. x 8, 10 and 12 ft. Planer.
- 38 in. x 12 ft. and 14 ft. Planer. New Haven.
- 54 in. x 42 in. x 24 1/2 ft. Planer.
- 62 in. x 48 in. x 17 ft.
- 72 in. x 48 in. x 30 ft. Planer, 2 heads, side planing attachment.

- 11 x 13 Horizontal Slide Valve Engine.
- 4 H.-P. Vertical Engine. A1.
- 1 00 and 3000 lb. Bement Steam Hammers
- Car Axle Lathe, Bement.
- 1 1/2 and 1 3/4 Bolt Cutters.
- 9 and 12 in. stroke Slotting Machines
- No. 3 Brainard and Union Vise Co., Millers.
- No. 76 Bliss Geared Punch Press.

**GEO. PLACE MACHINE CO.,**

120 Broadway, N. Y.

## BOILER ROLLS.

1 8 ft. 4 in. between housings, 9 in. diameter; built by New Doty Mfg. Co.

1 9 ft. 6 in. between housings, top roll 15 in. diameter. Others 10 in. diameter.

## Heavy Scrap Shears.

28-in. knives. Cuts old rails.

## Punch and Shear.

No. 2 Long & Alstatter; and many others.

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**MARVIN BRIGGS, 61-63 Rutgers Slip, N. Y.**

## SECOND-HAND MACHINERY.

- 2 100 H.-P. Locomotive Boilers.
- 1 75 H.-P. Locomotive Boiler.
- 1 20 H.-P. Locomotive Boiler.
- 1 40 H.-P. Locomotive Boiler.
- 1 75 H.-P. Zell Water Tube Boiler.

A large stock of Horizontal Tubular Boilers,

from 40 to 80 H.-P.

A large stock of Vertical Tubular Boilers,

from 10 to 50 H.-P.

- 30 x 60 Corliss Engine.
- Pr. 20 x 60 Corliss Engine.
- 22 x 42 Wright Engine.
- 14 x 18 Halsey Engine.
- 12 x 24 McLaren Engine.
- 12 x 12 Ball Engine.
- 4 H.-P. Portable Engine and Boiler.
- 25 H.-P. Westinghouse Eng.
- 10 x 12 Phoenix Engine.
- 9 x 12 Stearn's Engine.
- 5 x 7 Payne Vertical Eng.
- 4 x 6 N. Y. S. S. P. Vert. Eng.
- 2 x 3 Oscillating Engine.

## NEW AND SECOND-HAND PULLEYS.

NEW AND SECOND-HAND SHAFING.

NEW AND SECOND-HAND HANGERS.

NEW AND SECOND-HAND BELTING.

Pumps, Heaters, Dynamos and

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**MARVIN BRIGGS, 61-63 Rutgers Slip, N. Y.**

We have in stock several sizes of

UNIVERSAL RADIAL

## DRILLING MACHINES

Price \$450 up,

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**UNIVERSAL RADIAL DRILL CO.,**

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Corliss Engine, 14 x 36; first-class condition.  
Plain Engine, 12 x 30; good order.  
Belt Wheel, 8 ft. diam., 20 in. face, 7 in. bore.  
Belt Wheel, 10 ft. diam., 13 in. face, 6 1/2 in. bore; split.  
Belt Wheel, 11 ft. diam., 18 in. face, 13 in. bore; split.  
2 Sturtevant Fans, 8 ft. high.  
Clutch Pulley, 60 in. diam., 25 in. face, 5 7/16.  
Large assortment New and Second-hand Machinery  
Shafting, Pulleys, Belting, Tools, Iron, &c.

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## Great Bargain.

A full set of Automatic Cut-off Engine Patterns, with drawings, wood cuts and patent right to manufacture; are almost new, and were made by the finest workmen. If sold at once will let them go at a sacrifice. Address "ENGINE," No. 112, office of The Iron Age, 96-102 Reade street, New York.



**!!! FOR SALE !!!**

**BAKER BLOWERS**, Nos. 3, 4, 5 and 7.  
**ROOT BLOWERS**, Nos. 1, 2, 3, and 4.  
 Sturtevant Blowers, Nos. 1, 5, 6, 7, 8, 9 and 37.  
 125 H.-P. Geo Corliss Engine, right hand; a bargain.  
 7 H.-P. Otto Gas Engine, fine order.  
 24 in., 36 in. and 48 in. Wing Ventilating Fans. 20 in. x 24 in. Air Compressors and Receivers (Ingersoll straight line). A variety of Crushers, Hoisting Engines, Boilers, &c., cheap. Correspondence solicited.  
 C. R. BIGELOW, Machinery Expert and Appraiser, 46 Dey St., New York City

**WANTED.**

3 second-hand Trolley Motor Cars.  
 3 second-hand Trail Street Cars.  
 200 tons T-Rails, 40 lbs., fit to relay.  
 Advise price and particulars.  
**G. W. SCHULTZ & CO.,**  
 No. 308 Walnut St., Philadelphia.

**SECOND HAND, CHEAP.**

Brown & Sharpe No. 2 Screw Machine, wire feed.  
 Brown & Sharpe No. 2 Screw Machine, without wire feed.  
 Brown & Sharpe No. 1 Plain Miller.  
 18 in. x 8 ft. Jones & Lamson Engine Lathe, compound rest.  
 18 in. x 8 ft. Johnson Engine Lathe, compound rest.  
 30 in. x 30 in. x 8 ft. Pease Planer.

**DANIEL KELLY,**

51 N. 7th St., Philadelphia.

**FOR SALE.**

5 Centrifugal Pumps.  
 2 3 H.-P. Engines. New.  
 3 5 H.-P. Engines. New.  
 8 20 H.-P. Engines, also up to 80 H.-P. New.  
 10 5 and 10 H.-P. Gas Engines. New.  
 12 Drill Presses, new, different sizes.  
 800 Truck Wheels, new, 1½ cts., New York.  
 All guaranteed fully.  
**H. H. MANSFIELD.** 126 Liberty St., New York.

**4 BOILERS.**

Four second-hand 75 H.-P. Double-Deck Boilers, with all fittings and fixtures. In first-class condition. Cheap.  
 Two 2-flue Boilers, 48 in. diam. x 32 ft. long, in prime condition. Cheap.  
 One 16 x 22 Side Crank Engine.  
 One 16 x 36 Side Crank Engine.  
 Full line of new and second-hand Boilers and Engines always on hand.  
**H. M. Sciple & Co.,** 3d and Arch Sts., Philadelphia, Pa.

**FOR SALE.**

Blast Furnace, 55 ft. high, ¼-in. iron. All parts complete.  
 Three nests of plain cylinder Boilers; different sizes. All in good order.  
 One new 8-ft. Bell and Hopper.  
 Horizontal Engine, 28½ in. x 56 in.  
 Lot of Tanks, Stacks, Girders, &c., &c.  
 All will be sold exceedingly low.

**POULTERER & CO.,**

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**ROLLING MILL FOR SALE OR LEASE.**

Located in the City of Chicago; well equipped for city trade; capacity of about 100 tons of bar iron per day; it has one 10 in. and one 18 in. train, also one 18 in. muck train; owners will take all or part of pay in bar iron. For particulars write or inquire of

**CHICAGO FORGE & BOLT CO.,**

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**FOR SALE.**

One 16 x 24 in. Standard Gauge Locomotive.  
 One 15 x 20 in. Standard Gauge Locomotive.  
 One 7 x 12 in., 36-in. Gauge Locomotive.  
 Fire Box Boilers from 1 to 15 horse-power in stock; Engines, Boilers, Shears.  
 Hoisting Engines, Derricks and Contractors' Machinery.

**THOMAS CARLIN'S SONS,**  
Allegheny, Pa.**Ten Ton Traveling Crane**

Yale & Towne make, 38 ft. span; complete with Electric Motor. All order. For sale cheap.

**GEORGE PLACE MACHINE CO.,**  
120 Broadway, New York.**FOR SALE.**

Large lot of Loco. Boilers,  
 50 to 100 H.-P., in first-class order.

Can furnish stacks, grates and all fittings to suit purchasers.

**CHESTER BERTOLETTE & CO.,**  
Norristown, Pa.**FOR SALE. SECOND-HAND Street Rails**

FIT TO RELAY.

**DAN'L W. RICHARDS, & Co.**  
88-96 Mangin St., New York.**FOR SALE.**

2 Double Deck Boilers about 40 H.-P. each, good and cheap. 2 Iron Tanks, 8 ft. diameter, 30 ft. long, 3-8 iron, good order, 11,000 gallons capacity. 1 Cylinder Boiler, 30 x 40. Lot 15 x 20 Shells for Stacks. Square Tanks, 10 x 7 x 5, 2800 gallons capacity. Hoisting Engine. Gum Belt, good order. Large lot other Tanks and Boilers, all sizes. Scrap Iron and Metals.  
**BUSSENIUS & CUNLIFFE,**  
 1142 Washington Ave., Philadelphia.

**FOR SALE.****CRANK and GEARED SHAPERS.**

Write us for Bargains.

**J. STEPTOE & CO., Cincinnati, O.****PLATE MILL.****FOR SALE.**

Plate Mill suitable for nail works. For particulars, &c., address

**"PLATE MILL,"**Office of *The Iron Age*, 220 South 4th St., Philadelphia, Pa.**BUNDLING WIRE.**

In lots to suit.

**MATTHEW GILL, JR.,**

308 Walnut St., Philadelphia.

**BARGAINS.**

16 in. x 36 in. Corliss Engine.  
 12 in. x 24 in. Corliss Engine.  
 20 in. x 30 in. Plain Slide Valve.  
 12 in. x 15 in. Plain Slide Valve.  
 14 in. x 16 in. Vertical Engine.  
 12 in. x 14 in. Vertical Engine.  
 60 in. x 18 ft. Horizontal Boiler. New.  
 30 in. x 12 ft. Lathe.  
 15-ton Ice Plant.  
 Large stock of New Engines, Boilers, Machine Tools and Supplies.

**FRANK TOOMEY,**

131 North Third St., Philadelphia, Pa.

**FOR SALE.**

25 lb. section iron T Rails in good condition for relaying.

**WM. H. PERRY & CO.,**

Providence, R. I.

**FOR SALE.**

A very strong Squeezer, with engine attached, 17 in. x 24 in.; weight of squeezer alone 96,000 lbs. In use two years. For further particulars address P. O. BOX 205, Pittsburgh, Pa.

**Corliss, Wright, Porter-Allen, Buckeye and Slide Valve Engines, Boilers, Pumps, &c.**

In First-Class Condition. For Immediate Delivery.  
 60 H.-P. Westinghouse Standard Engine, almost new.  
 25 H.-P. Westinghouse Junior Engine, in good order.  
 8 x 25 Brennan Crusher, good as new.  
 80, 80 and 60 H.-P. Horizontal Boilers, insured 80 lbs.  
 30 H.-P. Marine Locomotive Boiler, economical.

Slide Valve Engines. Corliss Engines.  
 16 x 36, rated 100 H.-P. 28 x 48, rated 400 H.-P.  
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 11 x 24, rated 40 H.-P. 23 x 36, rated 300 to 350 H.-P.  
 10 x 20, rated 80 H.-P. 14 x 42, rated 85 to 100 H.-P.  
 16 x 48, rated 100 H.-P. 30 x 72, rated 600 to 700 H.-P.  
 8 x 8, rated 16 H.-P. 20 x 48 Wright Engine.  
 14 x 80 Porter-Allen Eng. 11 x 20 Buckeye.  
 11 x 24 Porter-Allen Eng.  
 Woodward Steam Fire Pump, 1000 gallons capacity.  
 Worthington Duplex Pump, 10 x 6 x 10.  
 Niagara Pressure Pump, 12 x 6 x 12.  
 Blake Pressure Pump, 10 x 6 x 12.  
 Guild & Garrison Pump No. 2. Deep Well Pump.  
 Cameron Low Service Pump, 350 gallons.  
 Three Ingersoll Rock Drills. One 8-ft. and one 9 ft. Blower.  
 Corliss Jet Condenser, 600 H.-P. Two Buckeye Condensers, 500 H.-P. each.  
 Emery Grinder Boring Bar. Two Platform Scales.  
 Boiler Iron Tanks, 800 and 200 gallons capacity.  
 Automatic Sawdust Feeder. 100 ft. of 7-in. Pipe, wrought iron.

**GEORGE M. CLAPP,**  
74 Cortlandt St., New York.**RELAYING RAILS FOR SALE CHEAP FOR IMMEDIATE DELIVERY.**

400 tons of 35 pound Iron Tee's with Fastenings.  
 800 " " 30 " " " " " "  
 300 " " 48 and 52 pound " " " "  
 100 " " 18 pound Iron Tee's.  
 250 " " 52 " Johnson Girder Steel Rails with Chairs. All rails in good condition for relaying. Have also a large quantity of Standard and Narrow Gauge Cars and Locomotives. I am always in the market to buy relaying rails, second-hand railway equipment and scrap.  
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**Brass Foundry For Sale.**

The Bridgeport Brass Founding Company's Foundry, located at 78 Railroad Ave., Bridgeport, Conn. Established over two years and running successfully. The owners cannot give it the proper attention, as they are in other business, and will sell cheap, \$2500 cash, balance on mortgage. Address

**J. W. CONDON,**  
76 Johnson St., Bridgeport, Conn.**WANTED.**

A Mill, situated at or near tide water, in the vicinity of Philadelphia, New York or Boston, to roll imported shearings in 100-ton lots into tack plate. For information in regard to the material, rolling, &c. Address

**RIPLEY & BARTLETT,**Plymouth, Mass.  
(Not in the Tack Combination.)**For Sale or Rent.**

Rolling Mill and Nail Factory of the Lewisburg Iron and Steel Co. Mill supplied with water, slate roof buildings, 2 engines, 4 large tubular boilers, 7 bundling furnaces, 1 large heating furnace with boiler over same, 42 nail machines, 2 trains of rolls, and other machinery. Connection with Pennsylvania R.R. and Philadelphia & Reading R.R. by switches on both sides of mill. Works now in operation. Address

**ALFRED HAYES, Secretary,**  
Lewisburg, Union Co., Pa.**WANTED.**

Second-hand Squeezer in good order, to take 125-lb. ball.

Address

**P. O. BOX 2766,**

New York City.

**WANTED.**

A new or second-hand portable rolling mill Scale, with or without trucks; must be strong and in Al condition, guaranteed to weigh accurately, with a capacity of 4 or 5 tons. Address, with lowest cash price, giving full description and particulars, **"ROLLING MILL SCALE,"** office of *The Iron Age*, 96-102 Reade St., N. Y.

**Parties Wishing Machinery**

of any kind manufactured, either in large or small quantities, please address the undersigned, who own near Boston a large and well equipped shop with the tools of latest pattern. Responsibility and satisfactory work guaranteed.

**"MANUFACTURERS,"**

P. O. Box 5305, Boston, Mass.

## REMOVAL. FOR SALE. A RARE CHANCE.

The Real Estate and Buildings of the Fort Scott Foundry and Machine Works Co., at Fort Scott, Kansas.

The most successful foundry and machine shop plant, and best location in the West.

The company owning and operating this plant continuously and very profitable for the past fifteen years, having brought out some patented specialties, that are sold mostly in the Eastern States, and also for export, were compelled, on this account, to locate further East, and now have under construction at Chicago Heights, Cook County, Illinois, with largely increased capacity, the buildings for their new plant, and will remove all the machinery in their Fort Scott works to Chicago about the 1st of December next.

The buildings are practically new, having been erected in 1886, and from the most modern and approved plants of foundry and machine buildings, are of ample dimensions for large capacity, well lighted, arranged for traveling cranes throughout, location the best in the city, on about thirteen acres of high ground immediately within the junction, and connected by switches with all the systems of railways entering Fort Scott.

Fort Scott has long been celebrated for cheap fuel, cheap living and a cheap and very desirable class of both skilled and common labor.

The business was established here 23 years ago and the works have never been closed. A large general foundry and machine shop trade comes to this city almost daily from half a dozen States and Territories; is in close proximity to the great coal, zinc and lead regions of Missouri, Kansas and Indian Territory.

### A Rare Opportunity for a Few Practical Men to Make Fortune.

The property will be sold at a great bargain, and upon easy terms.

Photos of the works, together with sizes and plans of buildings and full particulars, will be forwarded on application. Address

WALBURN-SWENSON CO.,

1520 Monadnock Block, - Chicago, Ill.

## FOR SALE.

New Manufacturing Property. Cost \$20,000; can be bought for \$15,000. Main building 40 ft. x 80 ft., three floors, with full line wood working machinery and tools. Store house 30 ft. x 90 ft., two floors. Work shops, lumber shed, dry kiln, brick boiler house, with new 50 H.-P. boiler and engine. Everything first-class; cheapest property in the State; a bargain for quick purchaser. Address "MANUFACTURER," P. O. Box 22, Fulton, N. Y.

## WANTED.

Responsible parties to manufacture and sell on royalty, a cheap portable steel or iron **CULVERT BRIDGE**; it is adapted to all small streams, runs, etc., in roads, streets, **RAILROADS**, etc.; improved roads is the order of the day; use this bridge, put it below the level of the road, cover it over and thus prevent jarring and wear and tear of vehicles, etc. Apply to

W. A. NICHOLS,  
Girard Building, Philadelphia, Pa.

## FOR SALE.

Large interest in a retail hardware establishment (incorporated company). The business is located on the principal retail thoroughfare of a prominent and prosperous Western city. A city of beautiful homes and in every particular a pleasant place to live. The company is now doing a paying business, particularly in the line of bicycles, house-furnishing hardware and other lines that pay a handsome margin of profit. This is an opportunity to become interested in an established business that is not often offered and will require about \$15,000 investment. Two or three parties with \$5000 each and a good knowledge of business can make a handsome thing out of it. The stock offered for sale in this company is owned by parties whose other large business interests demand all their attention; balance of stock is owned by managing stockholder, who would be glad to retain same and continue in the business. Any one who is looking for an opening in a nice retail hardware business, almost entirely cash, will be pleased with this opportunity. Address

"T. A. C.," Box 721,

office of *The Iron Age*, 96-102 Reade St., N. Y.

## A Manufacturer of Specialties

would prefer making contract for his entire output and exclusive sale with one or more financially responsible jobbing houses. The goods are A1 and well introduced. Profits large to the right party. Address

"MODERN STAMPED WARE SPECIALTIES,"  
office of *The Iron Age*, 96-102 Reade street,  
New York.

## Light T Rails FOR SALE.

We have about three miles of 12-lb. T Rails in first-class condition, complete with spikes, formerly in use in the four-mile tunnel. Also small Dump Cars, Dynamo, Root Blower, &c., &c. Call or Address

SWARTS IRON & METAL CO.,

551 to 557 State St., Chicago, Ill.

## BUSINESS FOR SALE.

A live, paying wholesale and retail hardware business in one of the most thriving cities of the South; 30,000 inhabitants and growing rapidly. Stock about \$40,000; can be reduced if necessary. A splendid opportunity. For further particulars inquire of

E. C. SIMMONS, President,  
Simmons Hardware Co.,  
St. Louis, Mo

## FOR SALE. IRON WORKS IN CHICAGO,

About one mile from Court House.

Foundry, Machine Shop, Pattern Shop, Blacksmith's Shop, &c.

Address

"C. R. C.,"

Office of *The Iron Age*, 59 Dearborn St., Chicago

## FOR SALE

Manufacturing property located in Pennsylvania, near Pittsburgh, comprising two large brick buildings and several smaller ones, with suitable boilers and steam engines. Coal can be furnished at 80 cents per ton. Would sell for cash, 60 per cent. mortgage, or would take part payment in the stock of a successful manufacturing company desiring to locate in that vicinity. Address

BOX 1367, New York Post Office.

## Nail Machines.

Outfit complete wanted for making 50,000 to 100,000 kegs cut nails per annum. A good second-hand outfit preferred. Give full description and lowest cash prices. Address

"M. P. Co.," No. 119,

Office of *The Iron Age*, 96-102 Reade Street, N. Y.

## FOR SALE.

A retail and jobbing establishment. This business is located in a large and prosperous Western city, and is an old and paying one and offers an investment which is safe and remunerative. Full details will be given to parties desiring further particulars. Address

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## FOR SALE.—Manufacturing Interest.

Parties desiring to change their business relations will sell their stock in a well established, prosperous and growing corporation located in Chicago, manufacturing specialties and a staple line of steam and plumbing goods. The stock earns large dividends annually and is an excellent investment. Full particulars upon application. Address "STOCK," office of *The Iron Age*, 59 Dearborn St., Chicago.

## WANTED.

We have a large foundry and machine shop in New York City, and would like to correspond with any one who can bring us some staple article of machinery to build or who can control orders for iron castings, with a view to some arrangement for mutual benefit or employment. Address, with particulars,

"FOUNDRY AND MACHINERY,"  
office of *The Iron Age*, 96-102 Reade St., N. Y.

WANTED.—Second-hand Machinery; must be in first-class condition and of modern design, at a low price:

One 24 in. x 24 in. Iron Planer.

One 45 in. Radial Drill.

One Davis Keyseating Machine.

One Automatic Gear Cutter.

One 28-in. Lathe. One 18-in. Lathe. One 22-in. Lathe.

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Or can be used for any kind of

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East Chicago, Ind., on the Belt R. R. (with several trunk lines); track on the premises main building, 90 x 180 feet; annex, 28 x 90; engine room, 24 x 26; melting room, 22 x 43; machine shop, 50 x 50 feet; 6 swinging cranes; elevated track for handling heavy machinery; Sturtevant blasting fans; 2 story office, 14 x 16 feet. Buildings new and thoroughly constructed of iron and brick. Ten acres of land, with railroad tracks on land and new canal across one end, giving water connection to Lake Michigan and Calumet River.

East Chicago has sewers, water, gas, electric light, new opera house and is growing fast.

Will sell with part of land or all, or remove such machinery as purchaser does not want. Price, as it stands, \$60,000. Terms satisfactory

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Complete Bessemer Plant, second-hand, by Galloways, Manchester. Only done 18 months' work. Consisting of one pair of High Pressure Vertical Blowing Engines, Cylinders 30 inch steam, 42 inch air, 4 feet stroke. Hydraulic Pumps, Accumulator, two Five-ton Converters. One Hydraulic Centre Pit and two Two-ton Ingot Cranes, Distributing Boxes, Cupolas, Cupola Staging, Lift and Casting Lades complete.

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A GENTLEMAN of 50, with business experience, highest standing, and capital if needed, desires to represent some firm or company abroad. Has large acquaintance and many years' business experience in Central Europe. Address

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New York, Jan. 6, 1898.

The Board of Directors of this Company have this day declared the regular quarterly dividend of TWO PER CENT. on the Preferred, and THREE PER CENT. on the Common Stock of the Company, both payable on the 1st day of February next at the transfer office of the Company, 185 Front St., this city. The transfer books will close Jan. 14 at 12 M., and reopen Feb. 2 next at 10 A. M.

G. WEAVER LOPER, Secretary

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For Engineers, Boiler Makers and Machinery supplies. Have large acquaintance with the trade; will give best of references. GEO. H. RUEL, 35 E. Indiana St., Chicago, Ill.

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**One Large Vertical Cylinder Boring Mill**, with separate engine to drive same, well adapted for marine or other heavy work.

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**RESIDENT** and traveling Salesmen, energetic and reliable men, to carry and push as a side line a patent first-class forged steel and useful mechanical tool. Address "K," Letter Carrier 15, Buffalo, N. Y.

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**GENTLEMAN**, aged 36, now and for many years past manager of a jobbing house in this city, dealing in a specialty used by the stove and hardware trade throughout the United States and Canada, is open for an engagement with a responsible house requiring the services of a competent and reliable business man as Manager, or to fill a similar position of responsibility; 18 years' practical business experience; thoroughly familiar with commercial usages, correspondence management of salesmen, &c. "PROGRESSIVE," Box 126, office of *The Iron Age*, 96-102 Reade St., New York.

**A PARTY** capable of making the best grade of perfectly sound mild grade steel castings would like to meet party with small capital to engage in the manufacture of steel castings; have had 23 years' practical experience in the iron and steel business; am competent to superintend the molding and mixing; or would accept position as steel mixer for some reliable firm; all references as to ability and quality of steel. Address "SREEL," office of *The Iron Age*, 59 Dearborn St., Chicago, Ill.

**TO MANUFACTURERS.**—The advertiser is desirous of representing in New York an established manufacturing house of reputation who will appreciate his close attention to their interests; references of the highest character will be furnished. Address "L.," Box 119, office of *The Iron Age*, 96-102 Reade St., New York.

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Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

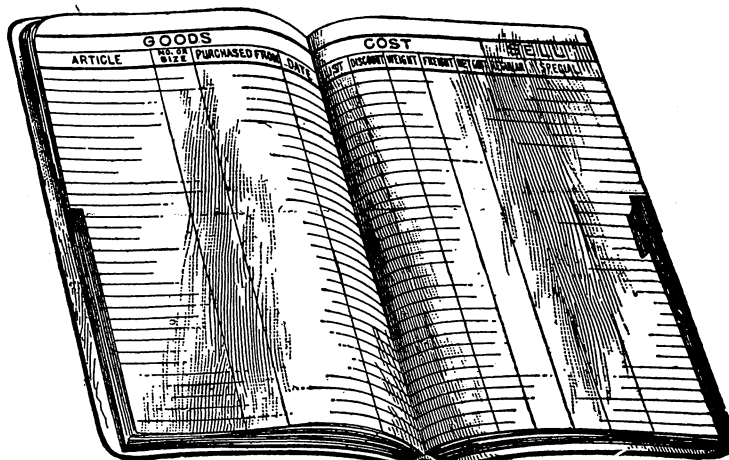
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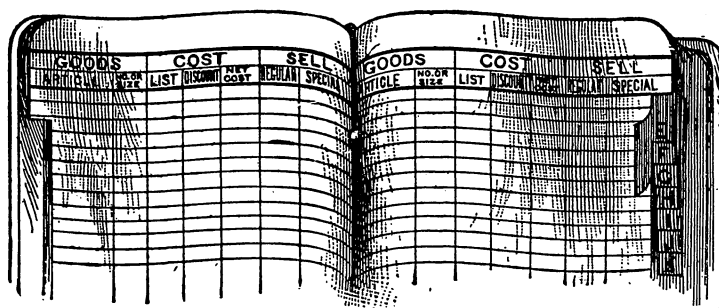
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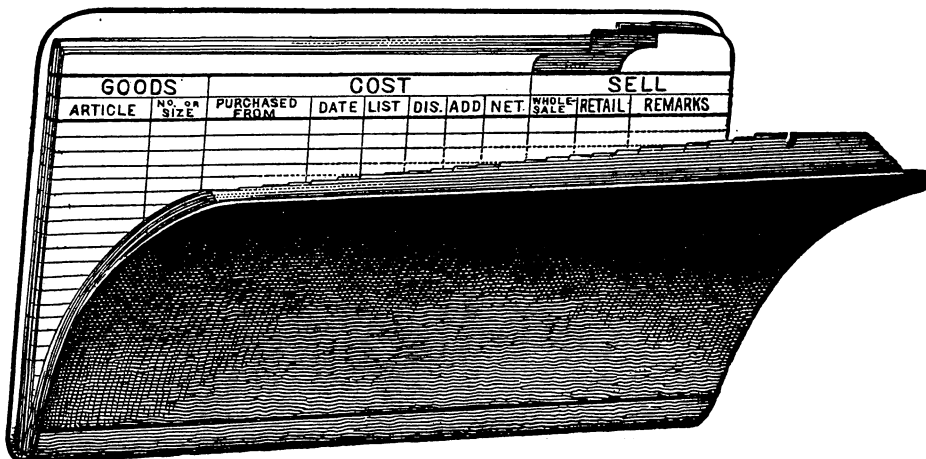
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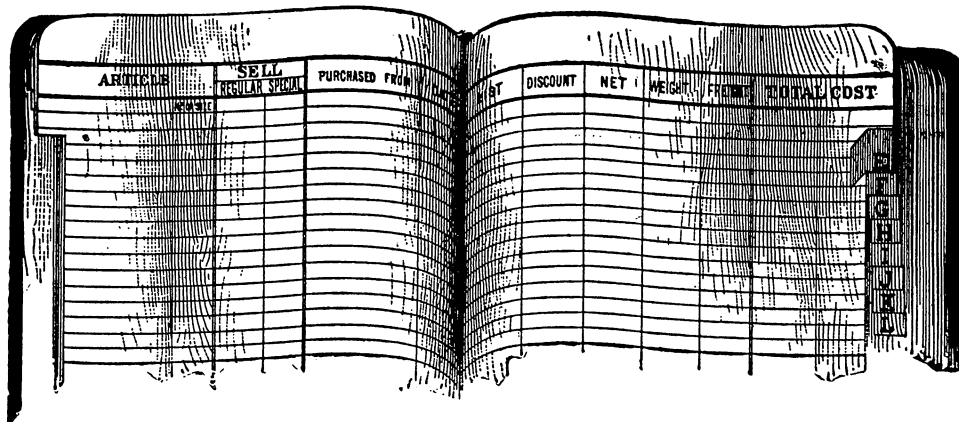
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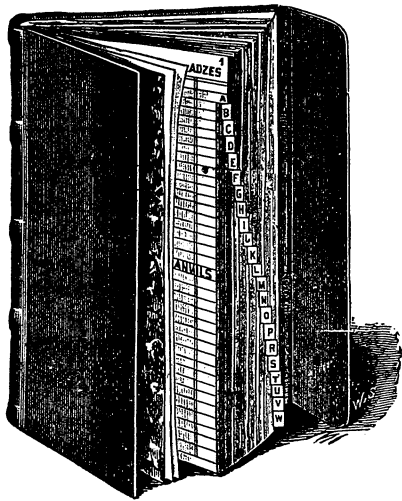
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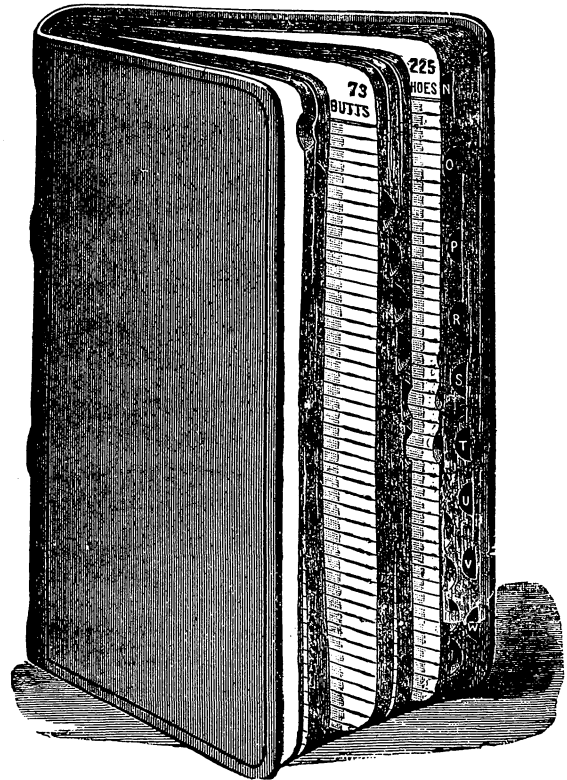
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*The above illustrations show the general appearance of Lamberson's Hardware Price Books.*

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The large size is recommended for office or store use. The small book is the same in all essential points as the large one, but is made on a smaller scale for convenience of those who require a book for the pocket.

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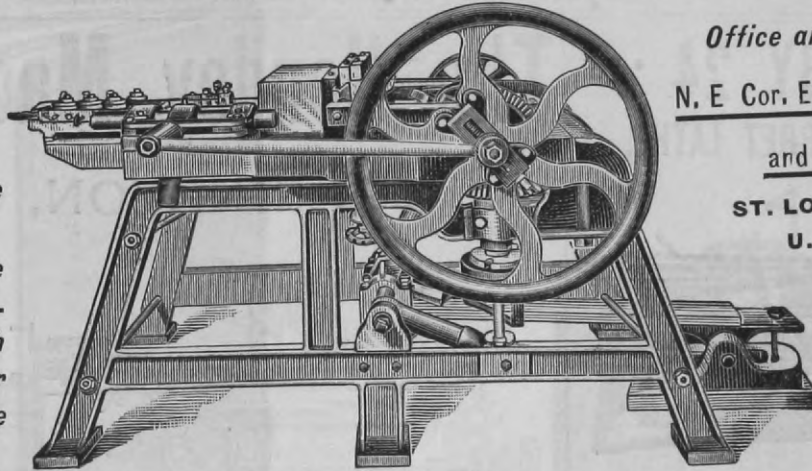
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**Makes Two Nails per Revolution from Single Wire.**

## WE GUARANTEE

50% more output.  
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50% less for repairs.  
10% less power to drive them.

All adjustments can be made while the machine is running, which enables an operator to attend to 25% more machines



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U. S. A.

Up to rod we make two nails per revolution from a single wire.  
All machines are made with wrought iron levers with gun metal bushings.  
Tempered steel cams and rollers. Machine steel shafts.

We use only one stock screw to adjust knives.

All machines have our adjustable feeder, which runs two weeks without resharping.

All machines are adapted for making any kind of special nail.

We furnish one set of dies and cutters and necessary wrenches with each machine.

We can furnish dies and cutters for making all kinds of special nails or drawings and full information for making dies and cutters for making special nails. Any other information, with discounts on our goods, will be cheerfully furnished on application.

Send for Prices and Description to the Manufacturers.

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Containing complete instructions of Designing, Drawing, and Constructing Spur Wheels, Bevel Wheels, Lantern Gear, Screw Gear, Worms, &c. and the proper formation of Tooth Profiles. For the use of Machinists, Pattern Makers, Draughtsmen, Designers, Scientific Schools, &c. With many plates. By J. Howard Cromwell. 12mo, cloth. \$1.50.

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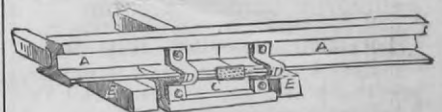
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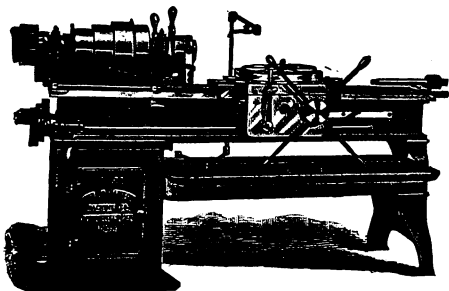
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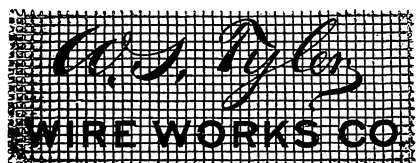
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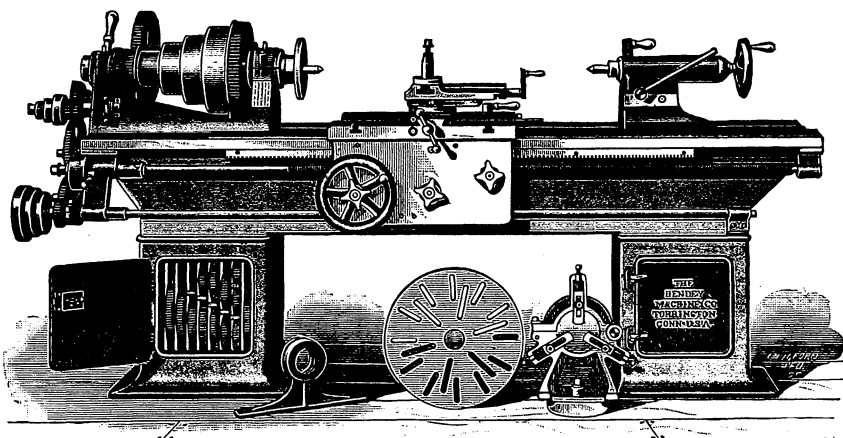
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18 in. x 8 ft. Engine Lathe, of heavy pattern.  
Hollow Spindle, Power Cross Feed, Compound or Raise and Fall Rest, Taper Attachment, &c.

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A SIMPLE, POWERFUL AND EFFICIENT TOOL,

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## THE ORIGINAL

### HOT FORGED and HAMMER POINTED.

By JUDICIAL DECISION.

Extracts of Judge Coxe's opinion. January, 1893.

"The defendant has advertised its nails upon their own merits, believing them to be the best nails manufactured. There has been no deception, no concealment, no false pretences. These nails have entered the market as the **Ausable Nails** and what reputation they have gained has been *under their own name and upon their own merits.*"

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"were made by the defendant (Ausable) before they were made by the complainant."

"The defendant used the words 'hammer pointed' long before the complainant used them and has so used these words to describe its nails continuously since 1872"

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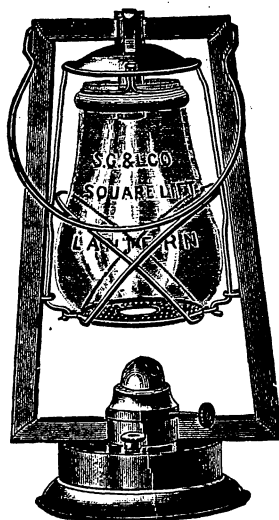
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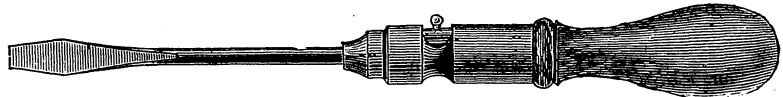
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Specialties  
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Square Lift Wire Lantern, Open.

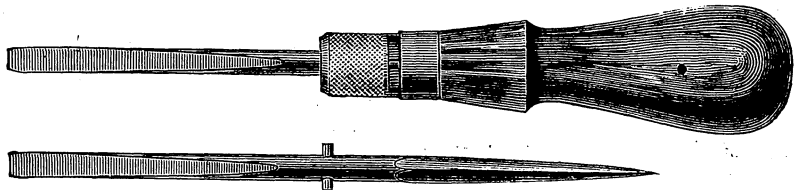
## No. 2 RATCHET SCREW-DRIVER.



This is a Single Pall Ratchet Screw-Driver. Like the No. 1, it drives a screw in or out with the ratchet, or may be made stationary. The whole length is eleven inches. The Handle is cocobola, both bit and handle highly polished, and the bit nickel-plated as well as the metal part of the handle.

Price, with one Bit.....\$12.00 per dozen.

## DUPLEX SCREW-DRIVER, No. 1.



Generally when a Screw-Driver is used, some tool is wanted to make a hole for the screw. This Square Reamer on the reverse end of the driver is better for that purpose than a gimlet or any other tool. The tool can be turned around instantly so as to use either end. It is hand-forged, carefully tempered, polished and nickel-plated. The handle is cocobola polished, with a nickel-plated chuck. This is entirely new, and we judge will be a popular tool.

Price, complete.....\$6.00 per dozen.

" for Bits alone to fit Handle..... 1.80 "

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THE BEST IN THE WORLD.

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## Lessee, Branford Lock Works.

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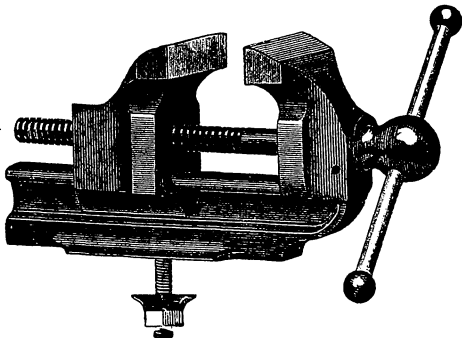
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3 inch, \$1.75. 4 inch, \$3.50.  
3½ " 2.25. 4½ " 5.00.

For Catalogue of Full Line, apply to

**ATHOL MACHINE CO.,**

ATHOL, - - - MASS.

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**HARDWARE  
SHELF BOXES**

Made of Wood.  
No screws or  
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**615 Commerce St. Phila.**

Send for circular and list of references.

Palmer's Common Sense Frame Pulley



MANUFACTURED BY

PALMER HARDWARE MFG. CO., Troy, N. Y.

THE DEALER who sells what  
THE PEOPLE ask for

MAKES FRIENDS and MONEY, and  
SAVES TIME and TROUBLE.

The people ask for

## LePage's Liquid Glue,

And the people are right.

It is the strongest and best glue made. It has been imitated, but never equalled. Be sure to get what you order and ACCEPT NO SUBSTITUTES.

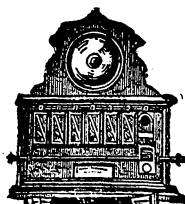
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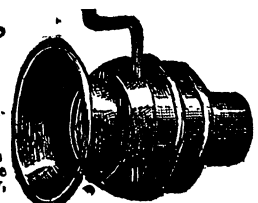
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## Pumps, Hydraulic Rams, Garden Engines,

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## DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY, AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 190.

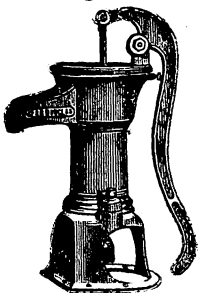
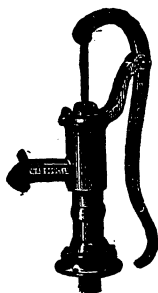


Fig. 70.



or wherever it is desired to raise a large quantity of water by hand power.

The pump has large valves (accessible by hand) and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

Capacity from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced. Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.

Fig. 209.



Fig. 331.

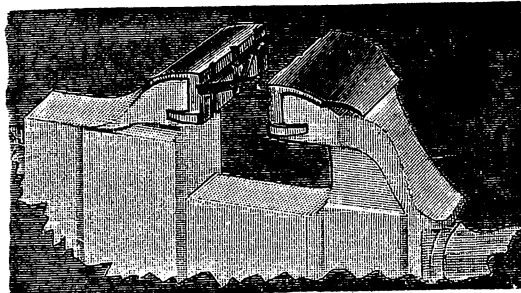


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MANUFACTURERS OF  
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ARTESIAN WELL CYLINDERS  
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### BINGHAM PATENT VISE JAW CAP

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3 1/2 inch.	.....	per pair,	40 cents.
4 "	.....	"	50 "
4 1/2 "	.....	"	60 "

**PRENTISS VISE CO.**

44 Barclay St., New York.

### A NEW CHAIN PUMP



**KEBLER'S PATENT**  
Galvanized Iron Tubing  
FOR CHAIN PUMP.  
Is guaranteed to be  
**THE BEST.**

IT is made of best quality Galvanized Iron, which will not rust nor accumulate filth.

IT only weighs one-half pound to the foot, wet or dry, while wood tubing saturated with water weighs one hundred pounds or more.

IT will last longer than wood tubing.

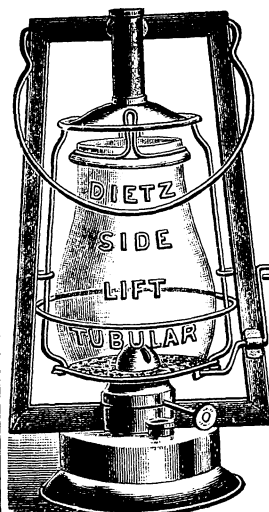
IT will not freeze in any climate.

IT can be attached to any make of curb.

We also manufacture a Galvanized (all) Iron Curb. Address

**BELLEVUE PUMP CO.,**  
Sole Mfrs BELLEVUE, IOWA.

OR **A. F. SHAPLEIGH HDW. CO.,** St. Louis.  
Agents for Southern Territory.



ESTABLISHED 1840.

### A WORD TO THE WISE IS SUFFICIENT.

When you purchase a Lantern, Street Lamp, or Driving Lamp, remember the

### "DIETZ" Make

is the best. Our goods have stood the test of time and are safe and reliable. The name "DIETZ" is plainly stamped on them. Our specialty is Tubular Lanterns, Street Lamps and Driving Lamps. We make a large variety being the oldest and largest house in our line.

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**MYERS' REVERSIBLE STEEL & WOOD TRACK HAY CARRIERS**

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.

BEST HAY TOOLS IN THE MARKET.

**MYERS' FORCE AND LIFT PUMPS**

Simple, durable, powerful, easy to operate never affected by frost. **PATENT GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

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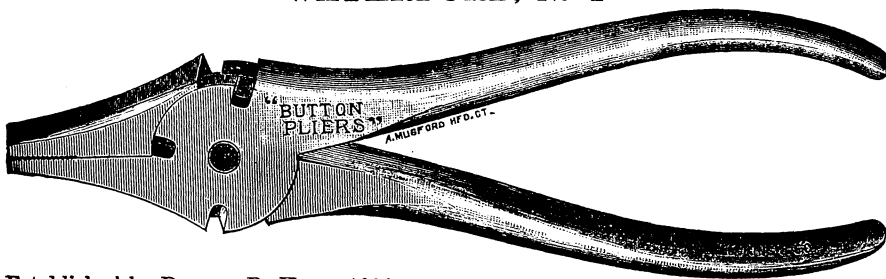
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**Pat. Wire Cutter  
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Specially Adapted for Use on Wire Fence.

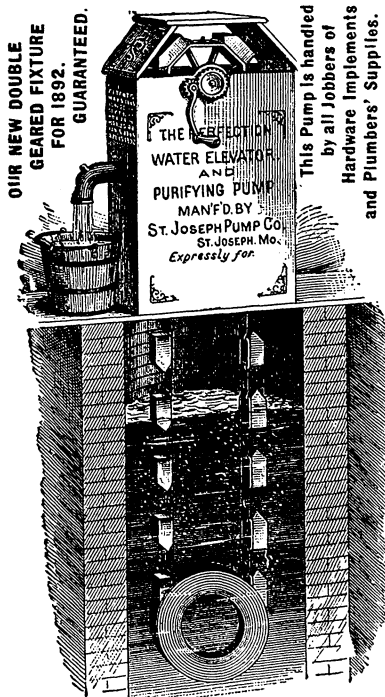
Also Manufacturers of BLACKSMITHS' and  
MACHINISTS' STOCKS and DIES, PLUG and  
TAPER TAPS, HAND, NUT and SCREW  
TAPS, PIPE TAPS and REAMERS.

Price-List on Application.

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THE DREADED DISEASE ALMOST WITHIN OUR BORDER.



**THE PERFECTION  
WATER ELEVATOR & PURIFYING PUMP**

MANUFACTURED BY THE  
**St. Joseph Pump Co.,  
ST. JOSEPH, MO.,**

HAS TRIUMPHED OVER ALL COMPETITORS.

**WHY?** Because we buy more steel, more cypress  
and pine lumber, employ more labor,  
manufacture and sell more Elevator Pumps than all other  
concerns engaged in the elevator pump business through-  
out the country combined.

**The Celebrated "PERFECTION" Water Elevator  
and Purifying Pump**

Is a sure preventive against **CHOLERA**, and with the  
dreaded disease already over the entire European Do-  
minion, it will enter our ports, with this one fact alone  
Dealers, the **PERFECTION** is bound to be a ready seller.

It is the only **BUCKET PUMP ON EARTH** where the  
chain or buckets are made of strictly one piece of **BLACK  
OPEN HEARTH STEEL AND STAGNATED**. If you  
being folded by double lap seams and the entire product  
galvanized after construction, which is not the case with  
any others on the market to-day, hence **OUR SUCCESS**.

The storage of water in cisterns and open wells is the  
method largely adopted throughout this country for Drink-  
ing, Cooking and Bathing purposes. The water contained  
therein becomes **FOUL AND STAGNATED**. If you  
will place a **"PERFECTION" PUMP** on well or cistern, we  
**GUARANTEE** the water to become and remain as **PURE**  
as a **MOUNTAIN STREAM**. It is the simplest structure for  
raising water on the Continent—guaranteed not to freeze.

**THE PERFECTION** having no Valves, Tubes or  
Plungers to get out of order, no Wood Tubing to rot, no  
the water, no attachment below platform, never has to be  
primed, packed or thawed out. Easiest pump operated.  
**OVER HALF MILLION PURIFYING PUMPS IN GENERAL  
USE**. We are stripping and decorating "The Perfection"  
in the finest manner possible. We now use 1 1/4 in. x 1 in.  
piece across top of curb.

A dealer wanted in every town. Be sure you get "The  
Perfection." Take no other. For full information, cir-  
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ST. JOSEPH, MO., U. S. A.  
E. A. KING, Secretary and Gen'l Manager.**

BUSINESS ESTABLISHED  
1798.

INCORPORATED  
1891.

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**HARDWARE, CUTLERY, TOOLS**

—AND—

**RAILWAY SPECIALTIES.**

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Monarch Cutlery Co., } Pocket Cutlery, Scis-  
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George Butler & Co., } Razors, Table Cutlery,  
etc.  
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Scissors, etc.  
Peugeot Frères, } Celebrated "Lion" Band  
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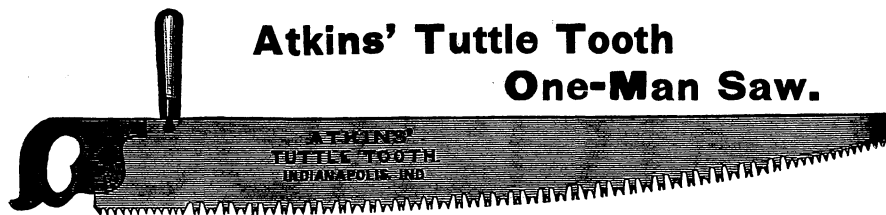
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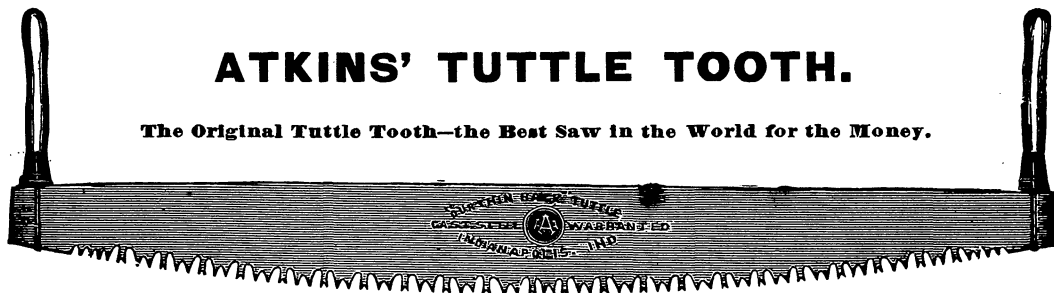
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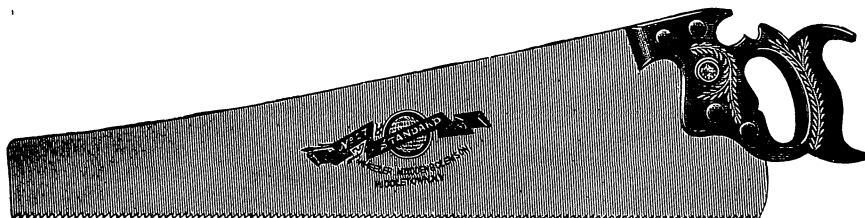
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For **10 YEARS** the Simonds Crescent-ground Cross-cut Saw (the only Saw on the market possessing these **ESSENTIALS**) has stood out prominently in contrast with all other makes of cross-cut saws. It has been the **CRESCENT-GROUND** against the **FIELD--MODERN IDEAS** against **ANCIENT METHODS**.

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(PATENTED DEC. 28, 1882.)

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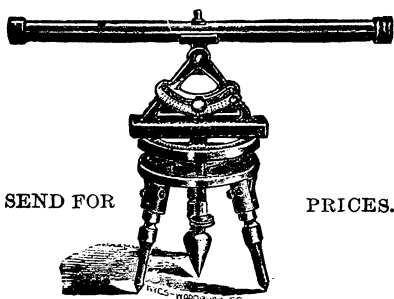
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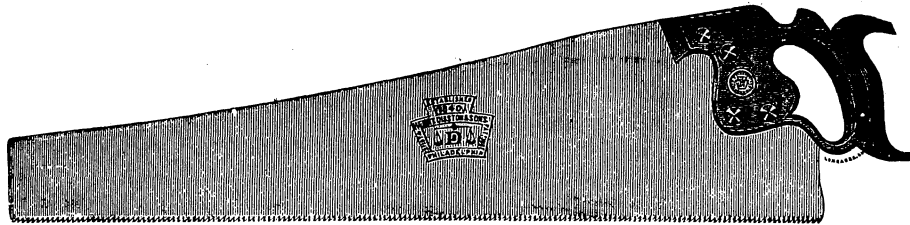
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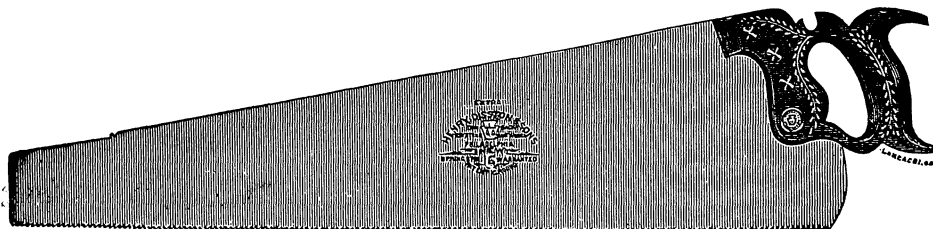
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This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

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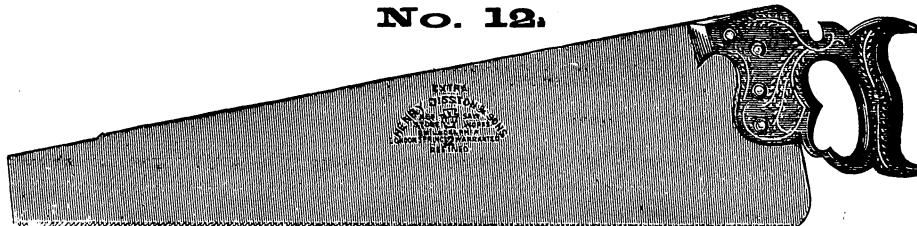
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AN EXTRA FINE SAW IN EVERY RESPECT.

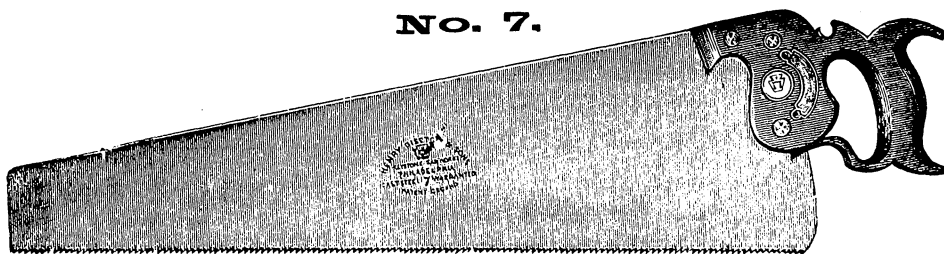
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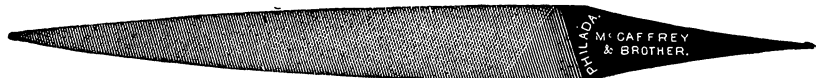
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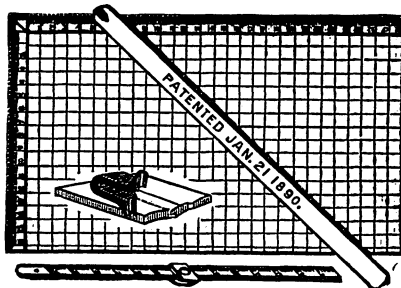
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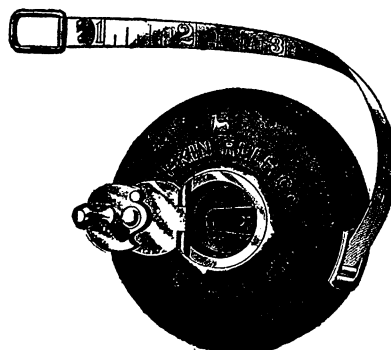
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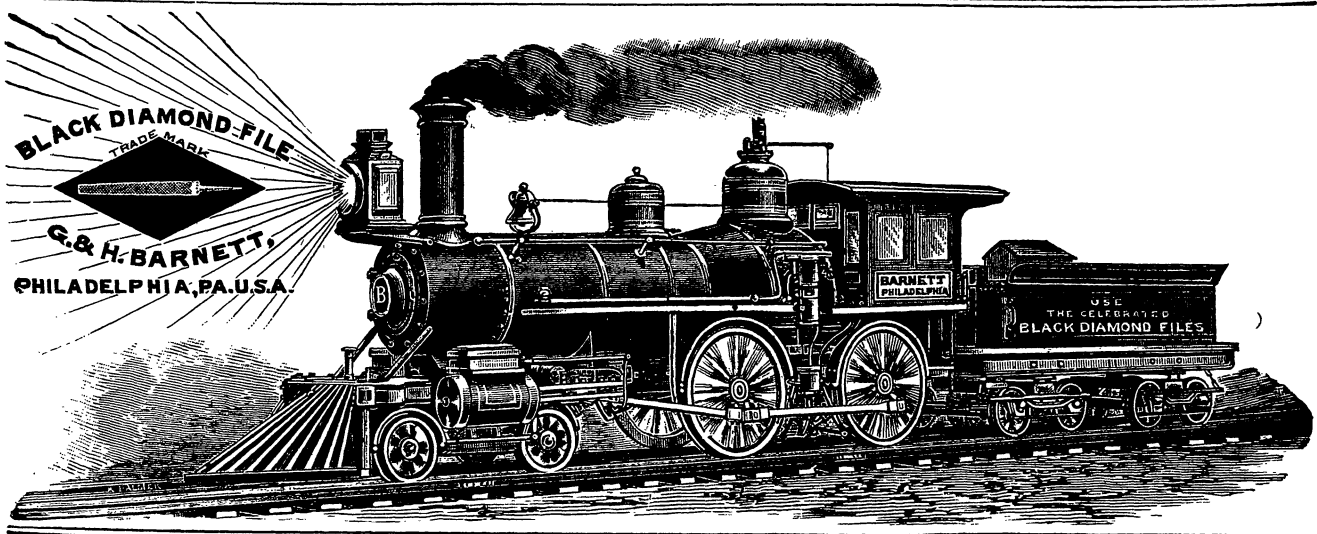
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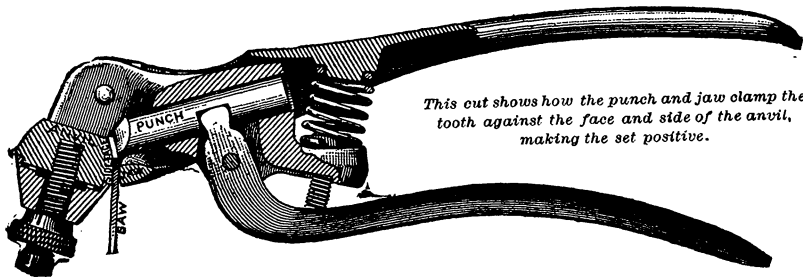
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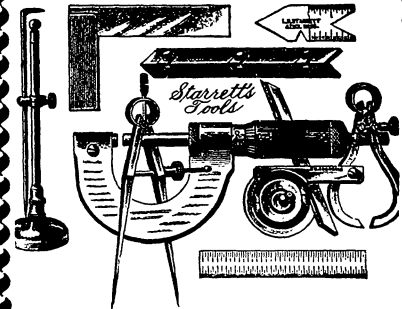
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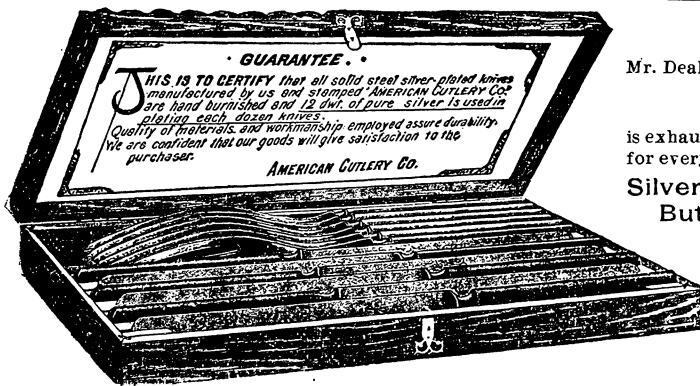
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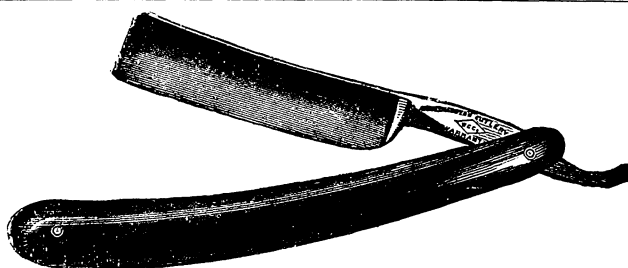
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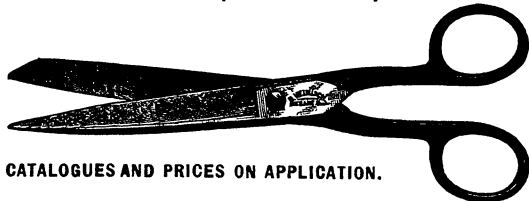
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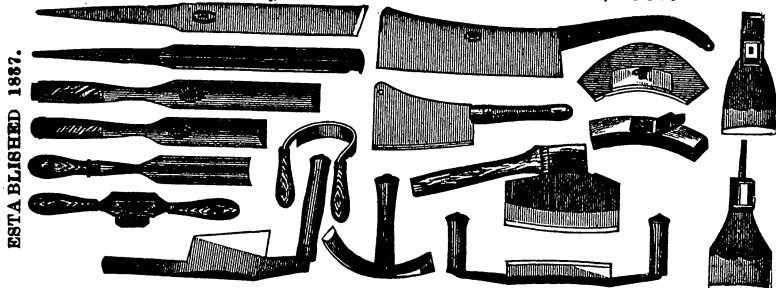
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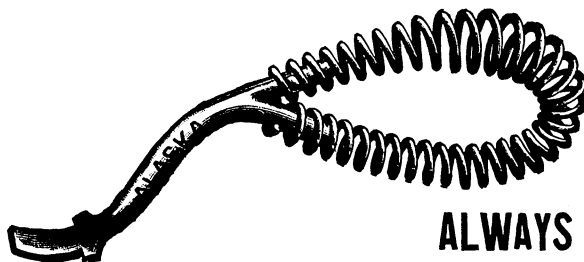
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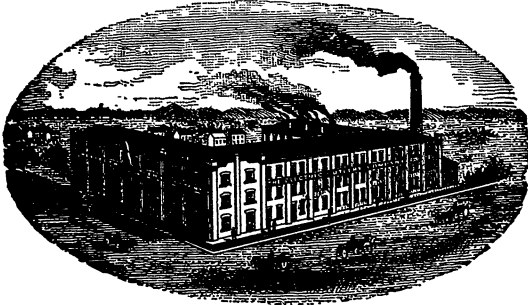
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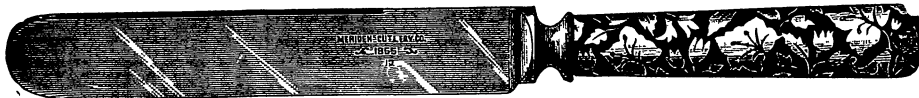
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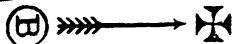
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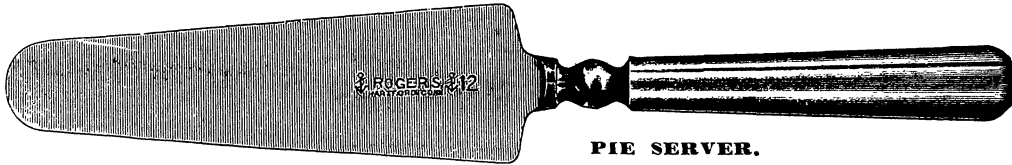
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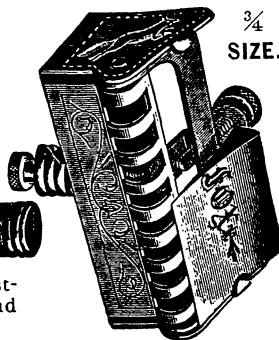
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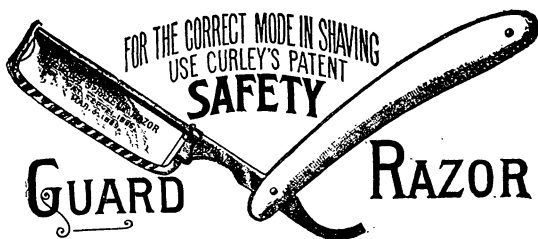
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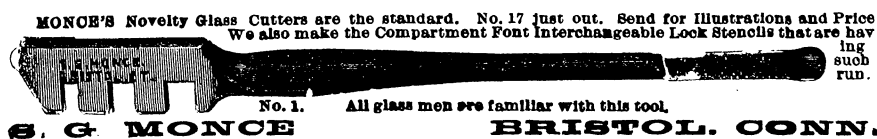
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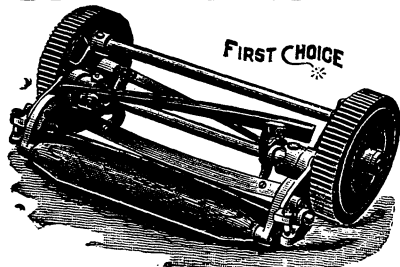
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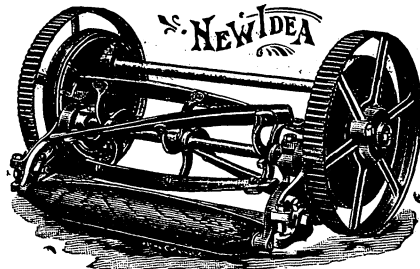
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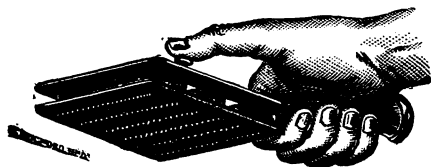
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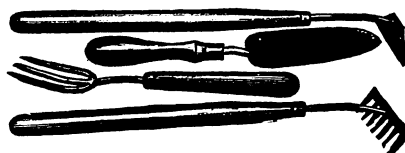


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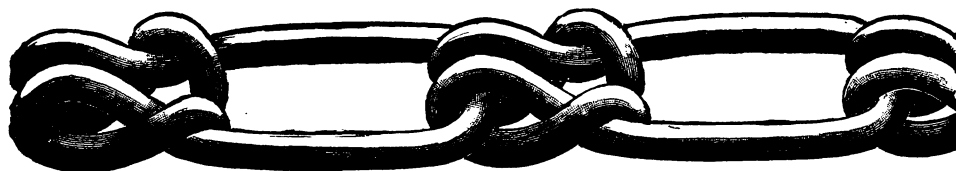
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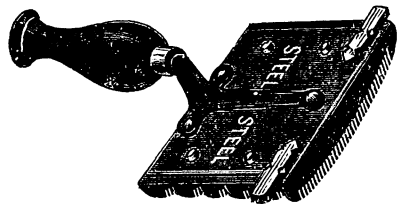
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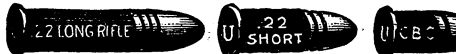


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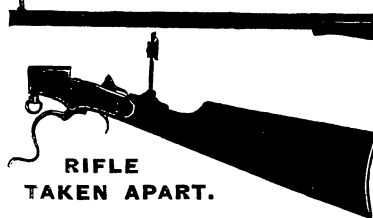
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RIFLE  
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WEIGHT, 4½ POUNDS.  
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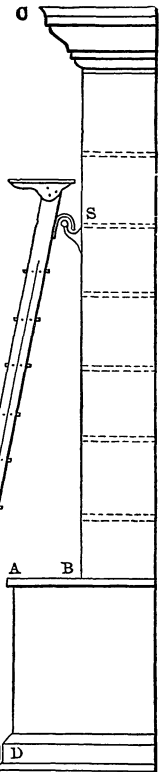
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New Floor Ladder  
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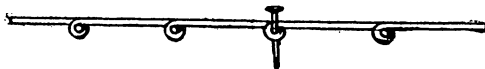
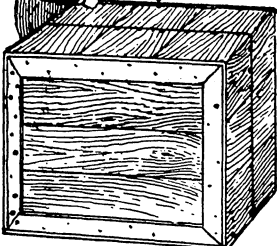


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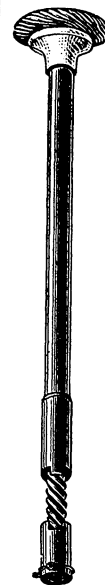
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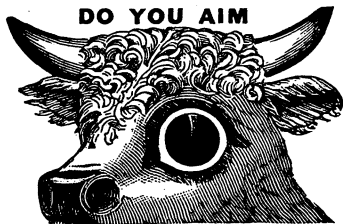
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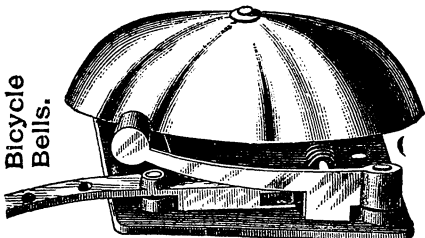
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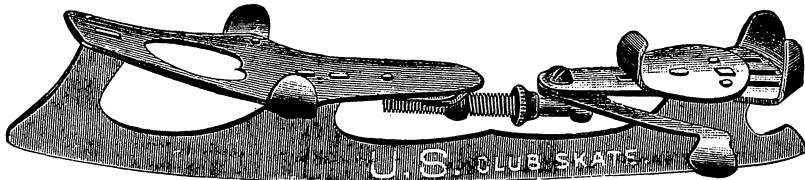
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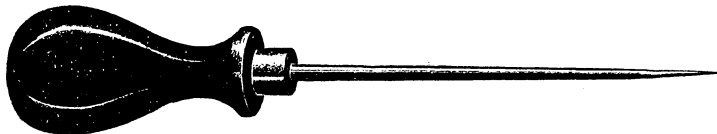
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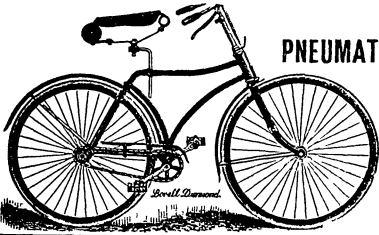
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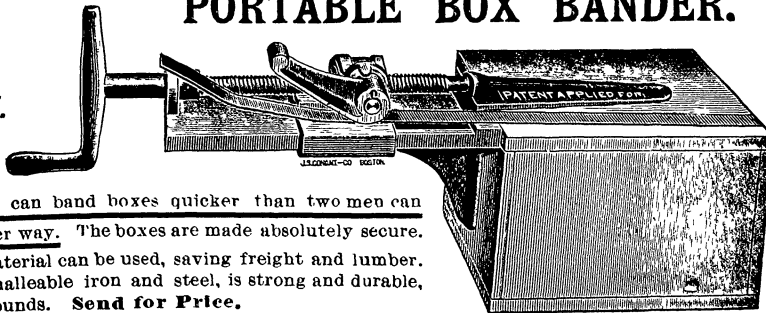
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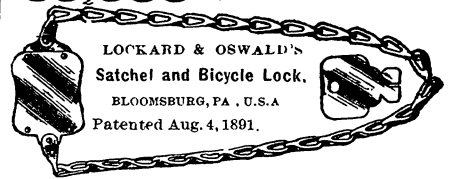


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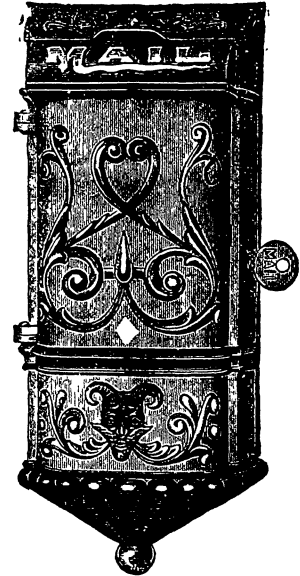


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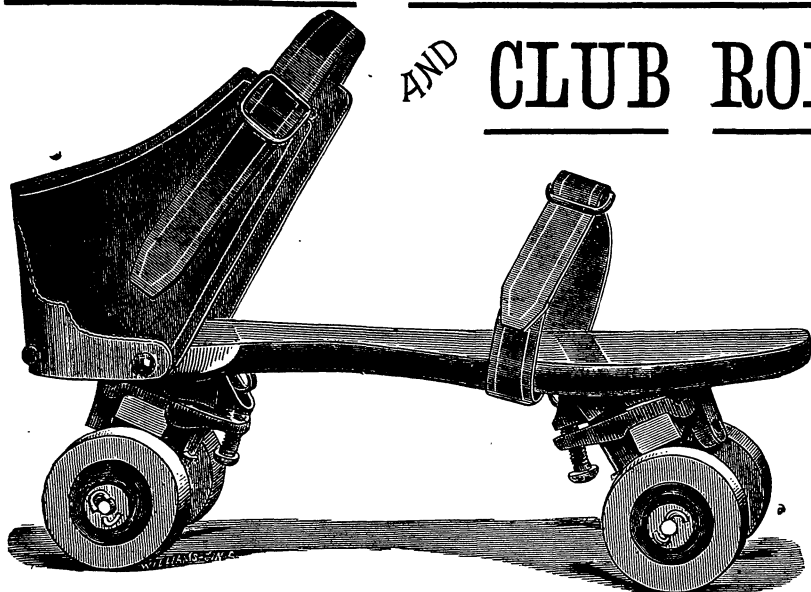


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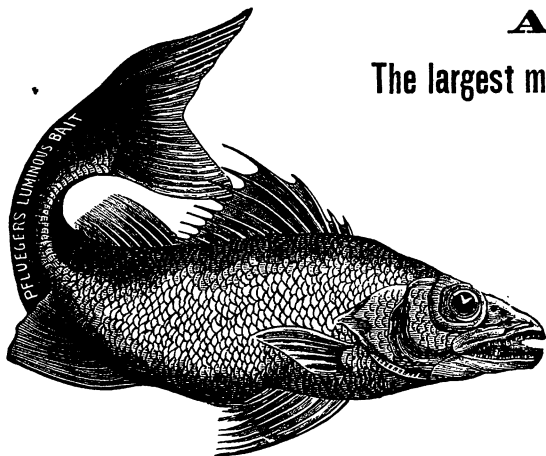
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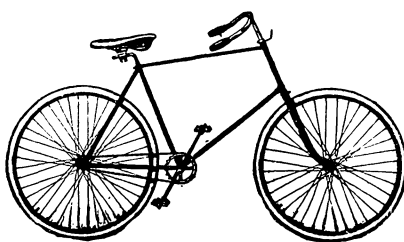
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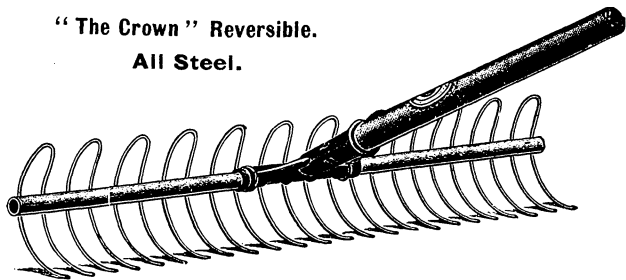
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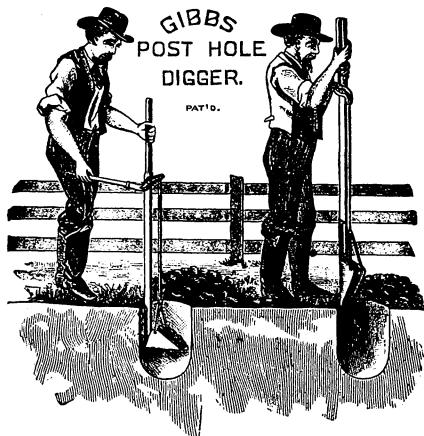
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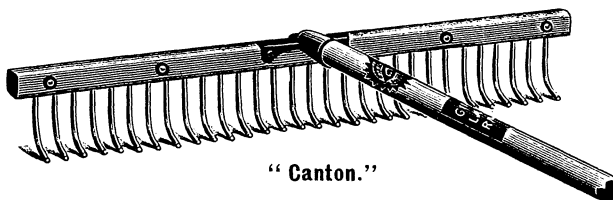
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You will find the line we represent the largest, best and most complete made.

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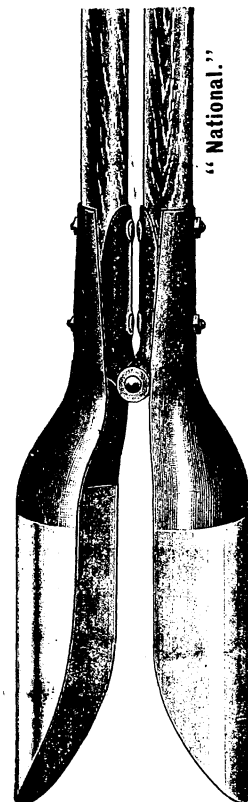
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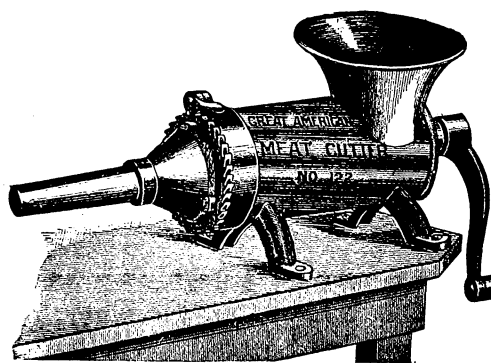


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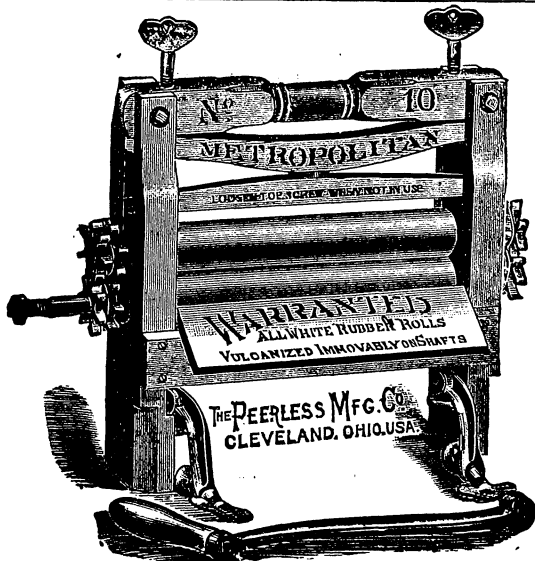
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This differs from our other wood frame wringers of medium price in having malleable iron swinging clamps of a strong and improved pattern, that swing under the wringer, and a folding apron, allowing the machine to be closely packed for shipment, and it is preferred by many because of the small space it occupies in storage. It is a handsome, well proportioned machine, of hard maple frame, the wood being selected, free from defects and blemishes. Two top thumbscrews, metal journal boxes and oil cups combined, double gears, etc.

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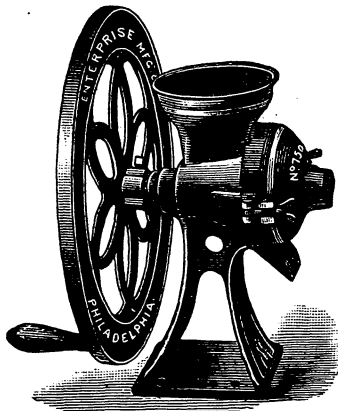
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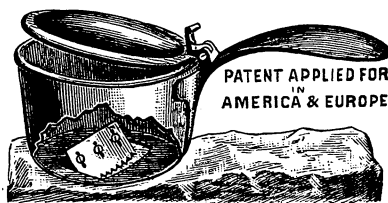
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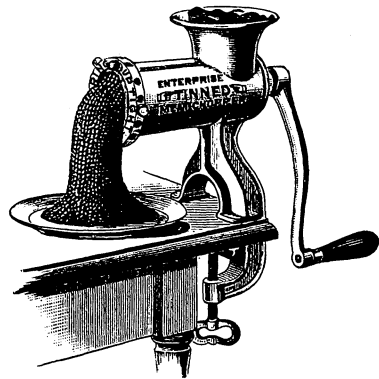
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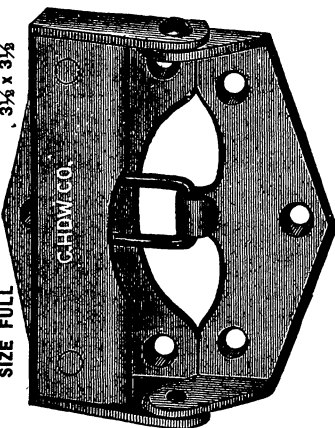
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On'y Covered Steel SPRING HINGE Made.  
SIZE FULL  
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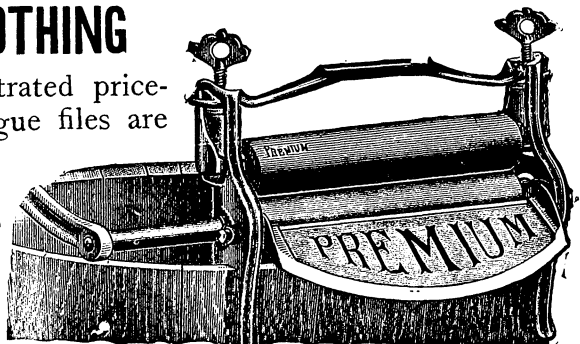
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Do not buy until you see it.

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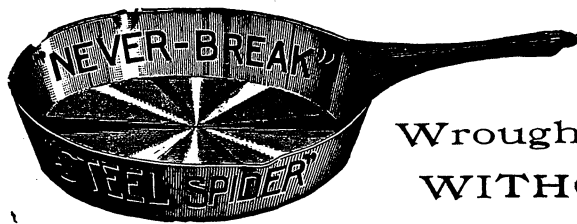
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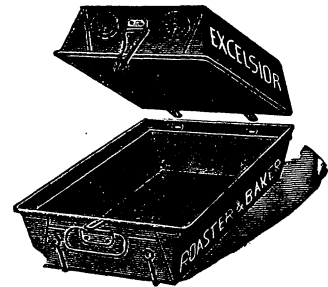
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The handle is made round, fits the hand perfectly and is ALWAYS COOL. The  
**"NEVER-BREAK"** Spider is the ONLY Wrought Steel Spider manufactured  
WITHOUT RIVETS complete from ONE PIECE OF METAL.

Wrought Steel Kettles, Griddles, Stew Pans, Maslins, Scotch Bowls, Hotel Sauce Pans.

—SOLE MANUFACTURERS,—

**THE BRONSON SUPPLY CO.,**  
CLEVELAND AND NEW YORK.

Made in Two Grades.  
PLANISHED and PLAIN STEEL.

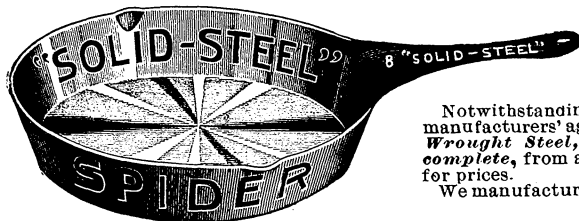
**"EXCELSIOR"**  
Roasting and Baking Pan.  
Seven Sizes.

**Making Ice Cream**

with a Peerless Freezer is a pleasure. It saves time and ice, and produces a finer Cream than any other.

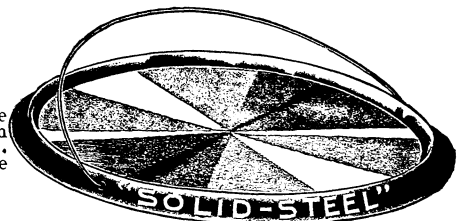
Try an assortment of sizes, they won't be "dead stock."

**THE PEERLESS FREEZER CO., INCORPORATED.**  
28-38 E. 9th ST., CINCINNATI, OHIO.

**"SOLID-STEEL" SEAMLESS HOLLOW WARE.**

BRILLIANT FINISH.

Notwithstanding the claims made by some manufacturers' agents, our spiders are made from *Wrought Steel, Without Seams or Rivets, complete, from a single piece of metal.* Write for prices.  
We manufacture our own goods.



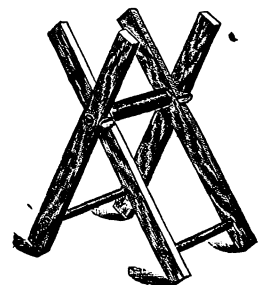
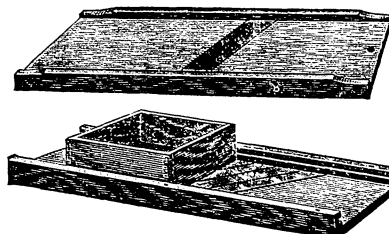
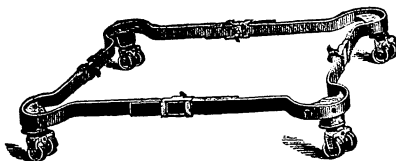
All Sizes Balled.

No Seams, no Rivets in "Solid-Steel" Ware.

**The Cleveland Stamping & Tool Co., Cleveland, O.**

We are in shape to figure on light and heavy stamping, and in addition to the above we build Dies and Stamping Machinery.

**TUCKER & DORSEY MFG. CO.,**  
INDIANAPOLIS, IND.



SEND FOR OUR CATALOGUE.  
WRITE FOR PRICES.

**ELIZABETHPORT CORDAGE CO.**

Manufacturers of

**ROPE AND BINDER TWINE,**

46 South Street, New York.

**A. S. HENN & CO.,**

Manufacturers of

Hardware Specialties, Can Openers, Pocket Wrenches, Mining Knives, Clothes Line Pulleys, &c.

Send for Catalogue.

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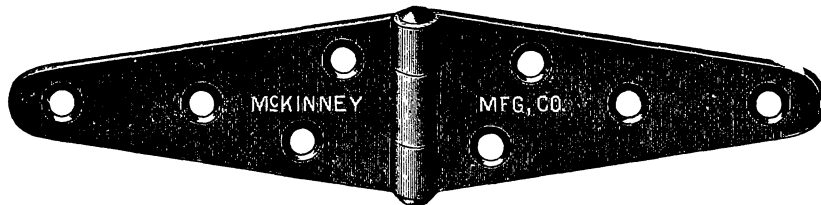


# McKinney Mfg. Co., Allegheny, Penn.

— WE MANUFACTURE —

## STEEL HINGES AND BUTTS EXCLUSIVELY.

SEND FOR  
LIST.



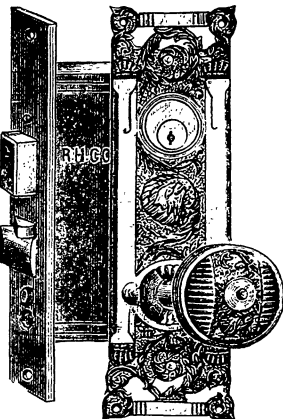
ORDERS FILLED  
ON SIGHT.

**"NONE BETTER."**

### FINE BUILDERS' HARDWARE

BRONZE METAL (All Finishes) and  
RUST-PROOF IRON.

"VASSAR" Cylinder Locks and  
Latches a Specialty.



COLUMBIAN DESIGN.

MANUFACTURED BY

Reading Hardware Co.,  
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— WAREHOUSES —

NEW YORK. PHILADELPHIA. CHICAGO

ARTISTIC HARDWARE.  
A Variety of Designs.



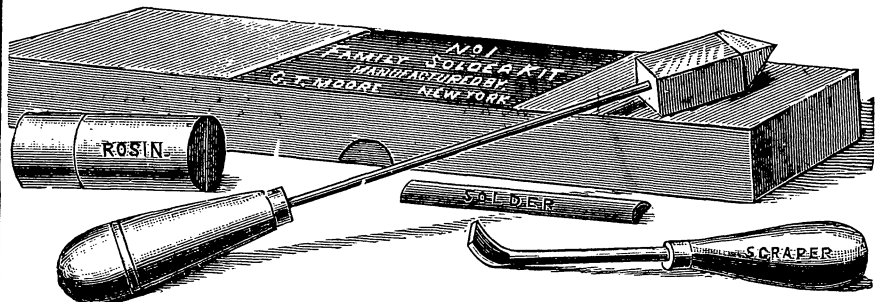
### Porcelain Lined Lemon Squeezers



Best Common Mouse Traps, Steak Hammers,  
Boot Jacks, Lap Boards, Beacon Hill Pat. Mouse  
Traps, Mallets, Bung Starters, Hand Screws.

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IF YOU WANT THE BEST  
SILVER PLATED SPOONS  
FOR CATALOGUE  
& PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.



A convenient, useful and salable Household set for soldering.  
The outfit retails for 25 cents.

G. T. MOORE, - 112 Chambers St., New York.

### 1893 - POST'S - IMPROVED - EUREKA'S, THE SUGAR MAKER'S FIRST CHOICE.

The Only Sap Spout made on Scientific Principles. The Flow of Sap Greatly Increased  
by the Self-Sealing Air Trap in them.

Over 15,000,000 sold to replace Various other Kinds.

Twenty-five per cent. More Sugar and a Better  
quality than from any  
other, is the verdict of over  
40,000 Maple Sugar makers  
who use them. Their per-  
fect working with satisfaction  
is guaranteed.

Agents wanted in every  
Maple Sugar Town. De-  
scriptive Circulars with  
price-list and Sample  
Spout sent free to the

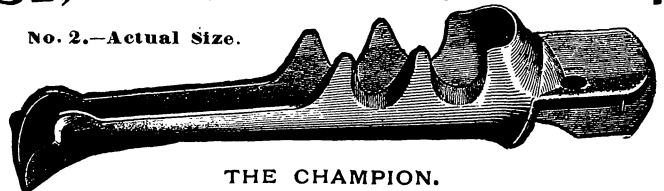
trade only. Owing to the usual heavy orders at this season  
of the year it is expedient that all orders for the coming  
sugar season be forwarded as soon as possible, to give the  
required time for supplying all demands, and that shipments  
by freight can be made so as to reach their destination in due  
season. All orders will be shipped by freight unless other-  
wise specified in the order.

Write Immediately and secure early orders.

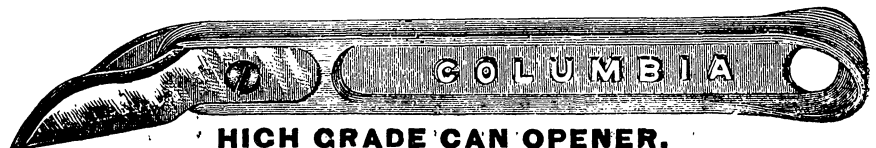
C. C. Post, Patentee, Burlington, Vt.

No. 2.—Actual Size.

Sold by the  
best Jobbing  
Houses



THE CHAMPION.

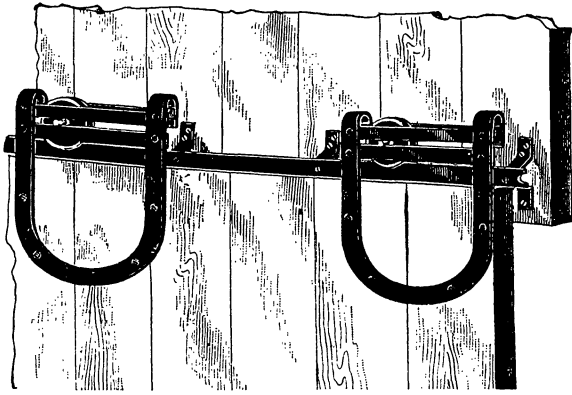


HIGH GRADE CAN OPENER.

A. F. Meisselbach & Bro., Mfrs., Newark, N. J.

— ALL JOBBERS. —





## Lane's Patent Steel Barn Door Hangers, "O. N. T." Track for same.

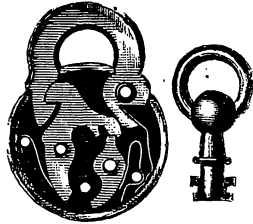
The first Anti-friction Steel Door Hanger placed upon the market and to-day stands as the original and best. Sold in all the States of the Union, as well as abroad. Also Lane's Noiseless Steel Parlor Door Hanger, using Single Steel Track, a great success.

Lane's Pat. Self-measuring Faucet, measuring liquids as drawn.  
Swift's Coffee Mills in great variety.

Manufactured by **LANE BROS.**, Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., NEW YORK.

## PATENT PERFECTION PADLOCK



*Eight Tumblers. Key Turning Both Ways.*

Sizes;  $\frac{1}{4}$  inch to  $2\frac{1}{2}$  inches; of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{5}{8}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

**AMES SWORD CO.**, Chicopee, Mass.

Send for Price Lists and Circulars.

## THE HANDSOMEST AND BEST JAIL PADLOCKS IN THE MARKET.

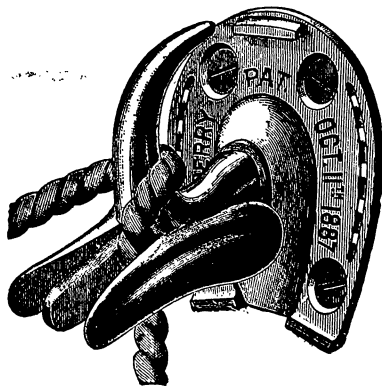
Cast Bronze.  
2 Nickel Plated Steel Keys each.  
4 Honest Tumblers each.



The Parts are MACHINE MADE, accurately fitted, durable and secure. Liberal discounts to the trade render these the cheapest fine Jail Padlocks in the market. For sale by the best Jobbing Houses and by all live Retailers.

No.	Weight, $\frac{1}{4}$ lb., 2-Keyed, 4 Tumblers,	PRICE, PER DOZEN.
99,	$\frac{1}{4}$ " 2 " 4	\$6.00
999,	$\frac{1}{2}$ " 2 " 4	8.00
	For Chain attached, add	2.00

**MILLER LOCK CO.**, SOLE MANUFACTURERS, FRANKFORD, PHILADELPHIA, PA.



## WALTER A. PERRY & CO.,

New Bedford, Mass.  
SOLE MANUFACTURERS PERRY'S  
PATENT HORSESHOE CLOTHES LINE  
AND WAGON BINDING HOOKS.  
Made of Superior Air Furnace Malleable Iron.

No knots to tie or untie. Can be fastened or unfastened in an instant. A lady can put up a line with the use of this hook without the slightest trouble, and have a perfectly tight line. Five fastenings made on one hook without tying a knot. One man can do the work of two in fastening a rope over a load, make a sure fastening, and save much time and bother.



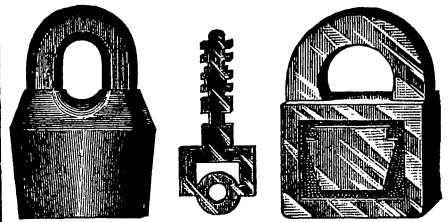
None of the unpleasantness of tying or untying frozen or hard knots. The bother of putting out a line vanishes with the use of this hook. Special discounts to the jobbing and wholesale trade.

## KEYSTONE LOCK WORKS,

— Established 1879. —

E. T. FRAM, Lancaster, Pa., U. S. A.

MANUFACTURER OF



Patent Inter-Locking Tumbler Scandinavian or Jail PADLOCKS, in 56 grades and sizes. Key and Self-Locking. Brass, Bronze, Steel and Malleable Iron. Red, Black, Bower-Barff and Bright Brown finish. Also a full line of fine flat padlocks in Bronze and Steel. All fully described and illustrated in our new catalogue, furnished free to the trade.

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## HARDWARE DEALERS

CAN RECOMMEND THE

## CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

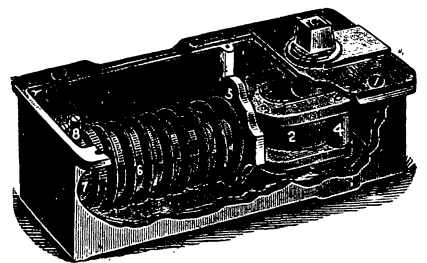
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**"THOMAS MORTON"**

65 Elizabeth Street,

Write for Prices.

**NEW YORK.**



## CHECKING SPRING HINGES FOR SWING DOORS.

Applied in floor under door. They close the door gently, without noise or violence and stop it at once at the centre. Doors cannot sag, springs do not break or set.

**J. BARDSLEY, 149 & 151 Baxter St., New York.**

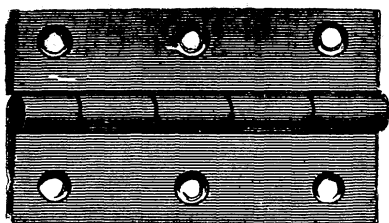
Illustrated Price-List on Application.

## SASH WEIGHTS

**E. E. BROWN & CO.,**

McKean and Meadow Sts.,

**PHILADELPHIA PA.**



## Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

**W. & J. TIEBOUT,**

Nos. 16 & 18 Chambers Street, New York.

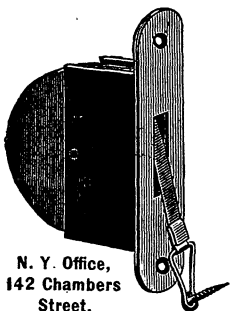
MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.**

## A WONDERFUL INVENTION OF Phenomenal Popularity.

This is not a Complicated Combination of Steel Ribbon, Pulleys, Attachments and Weights.

Our Balance costs the consumer half the money and lasts twice as long. Requires no Box Frames. Can be applied to old as well as new windows, exactly counterbalancing the weight of the sash.



N. Y. Office,  
142 Chambers  
Street.

Steel Frame, Aluminum Tape. Practically indestructible.

Every Balance warranted.

Ask for Pullman and don't confuse ours with imitations.

**THE PULLMAN SASH BALANCE CO.,** Rochester, N. Y.

## COMMON SENSE SASH BALANCE.



The Best and most Practical substitute for weights invented. The most Durable, the Cheapest and best device for all ordinary windows. Balances when in position are out of sight. No rivets, bolts or screws are used in putting it together, so that nothing can get out of order or need repairing. No cutting, boring or marring the sash, as the Balances are let into the jamb.

Manufacturers of Sash Balances, Sash Locks, Sash Lifts, Monitor Sash Irons.

**STEWART & BAKER,**

137 State Street, Rochester, N. Y.

No more **S**lamming!  
...Doors!

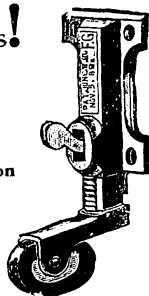
Our Combination

**Door Check  
Lock and  
Bumpers**

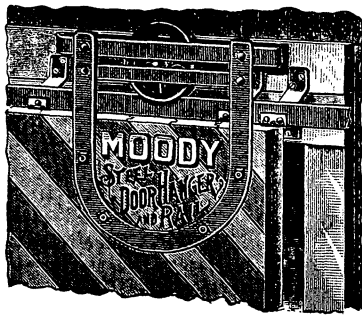
Holds  
door  
in  
any  
position

For sale by all Jobbers. Write  
for Circulars.

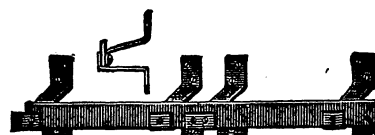
**Unity Door Check Co.,**  
81 Dearborn St., Chicago, Ill.



## VICTOR MFG. CO., Newburyport, Mass. STEEL RAIL.



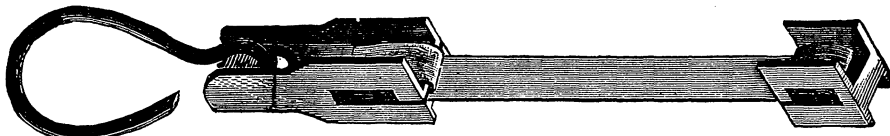
Showing one-half set of hangers attached to door.



The Only Bracing Bracket Made.

### PRICE-LIST.

HANGERS.	Per Doz. prs.
No. 5, to run 6 feet, 3½ in. wheel,	\$10.00
No. 6, to run 10 feet, 4½ in. wheel,	15.00
No. 7, to run 15 feet, 5½ in. wheel,	22.00
RAIL, per foot.....	6½ cents.



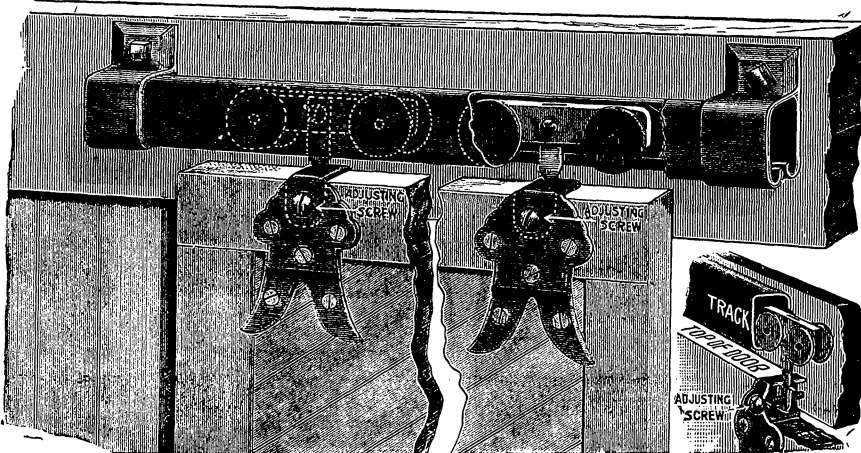
## "Acme" Aluminum Bronze Sash Ribbon Attachments and Square Groove Pulleys.

The Simplest Attachment.

Only Eight Pieces per Set.

**Caldwell Mfg. Co., - Rochester, N. Y.**

## SHUT THAT DOOR. I CAN'T.



THIS IS OUT OF BARN DOOR.

It's warped. You should have hung it on a Coburn Hanger. The warping of a door does not affect the running of the door on the track. No snow or ice can get into the track to block the same. The axle bearings are self lubricating. It's the only covered adjustable track on earth. Write for prices.

**THE COBURN TROLLEY TRACK MFG. CO.,** Sole Makers

HOLYOKE, MASS.



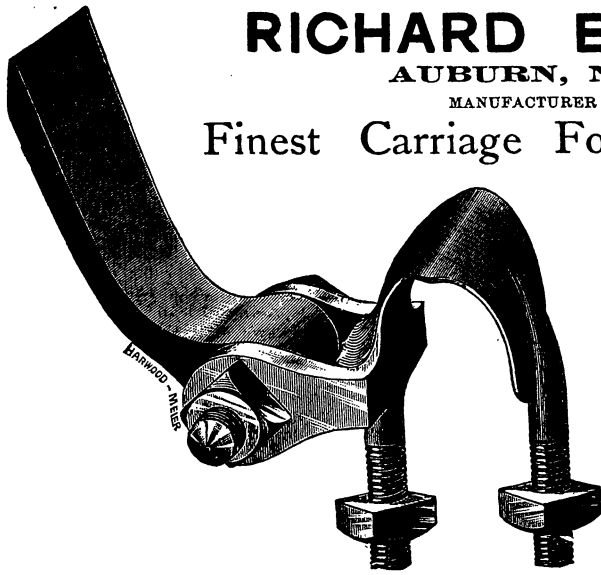
Crown and Giant Sash Cord and Bell Cord. Braided and Twisted Picture Wire Spool Wire, Clothes Lines, Ventilator Cords, Garden Lines, Chalk Lines, Annunciator Wire.

✻ Send for Catalogue, Samples. Prices. ✻

Bright Wire Goods, Picture Nails, Knobs, Hooks, Chain, Clothes Line Pulleys, etc.

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**OSSAWAN MILLS CO., Norwich, Conn.**



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MANUFACTURER OF

Finest Carriage Forgings, Couplings, Clips, King Bolts, Fifth Wheels, &c. Manufacture a full line. Special Drop Forgings.

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An Encyclopedia of Useful Technical Knowledge. A Great Labor, Time and Money Saver for Practical Men.

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## The English and American Mechanic:

AN EVERY-DAY HAND-BOOK FOR THE WORKSHOP AND THE FACTORY.

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## "THE NOISELESS" STORE LADDER.

IS the BEST.

WRITE FOR PRICES.

M. CROISSANT,  
ALBANY, N. Y.

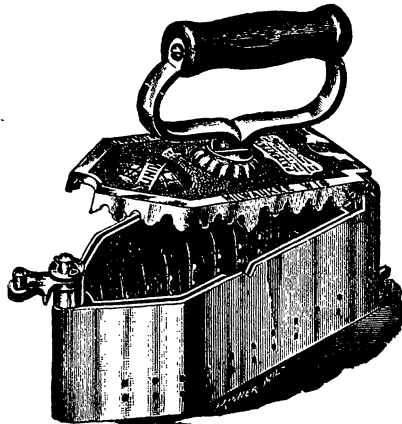
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Manufacturers of

All Kinds of Tinware and Sheet  
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.  
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.

THE  
UNIVERSAL SAD IRON CO.  
MILWAUKEE, WIS.,



Manufacturers of the Best Charcoal

## "SAD IRON"

in the world for  
Families, Dress and Cloak Makers  
and Tailors.

Send for Circulars and Sample Irons.

AGENTS WANTED EVERYWHERE.



## FROST'S ANTI-RATTLER

Pat. Jan. 20, 1880.

Out One-half Size.

Sample pair sent to any hardware or saddlery firm by dressing

The Frost Thill Spring Co.,

Boston, Mass.

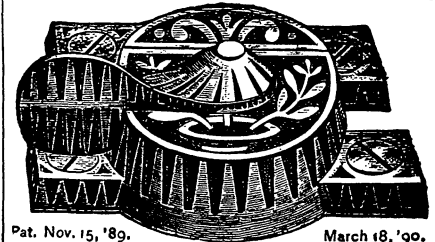
## THE WILCOX & HOWE COMPANY,

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## A Full Line of Carriage Hardware ALSO SPECIAL FORGINGS.

Estimates cheerfully given. Send for Catalogue.



Pat. Nov. 15, '89.

March 18, '90.

## THE CHAMPION

## Meeting-Rail Sash Lock

Has the greatest efficiency and a larger amount of the finest trade with first-class Hardware dealers than any other Sash Lock, showing the high appreciation of Architects, Builders and Dealers.

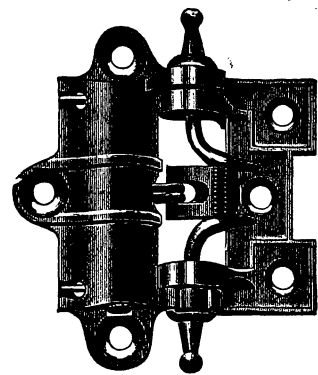
THE CHAMPION SAFETY LOCK CO.,

Frankfort Street,

CLEVELAND, OHIO.

## NEW IDEA SPRING HINGE

Holds the door strongest when closed.



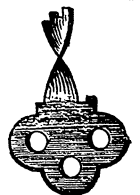
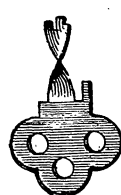
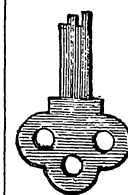
Resistance gradually decreases in opening

and increases in closing the door.

A covered (patented) hold-back Spring Hinge. Full particulars, free Sample and Prices by mentioning this paper.

## STOVER MANUFACTURING CO.,

145 River St., Freeport, Ill.



## PADLOCKS!!

We manufacture the best PAD-LOCK ever produced in this or any other country.

IMPROVEMENTS hitherto have been confined to the interior MECHANISM. Our improvement prevents access to the inner part of the lock. The most skillful expert cannot insert any kind of a tool except the proper key.

Hence We Have A LOCK for A LOCK. Write for Circular and Price-List.

## ROTHACKER & SCHULTZE.

31st and Master Sts.,

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## H. Sayers & Son,

MANUFACTURERS OF

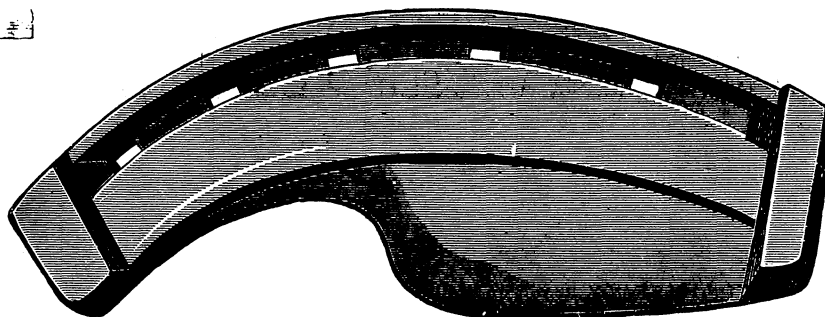
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Daily Capacity 16,000 Sets

SHERWOOD, MICH.

**SCRANTON FORGING CO.**  
 SCRANTON, PA.  
**CARRIAGE HARDWARE**  
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**SPECIAL DROP FORGINGS.**

**FORGED**  
**OX**  
**SHOES.**



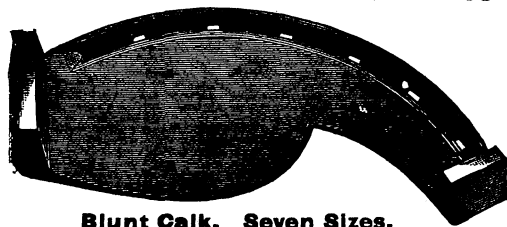
Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

**It is Just Right.**

Made under Deebie's Patent, Aug. 9, 1887.

**Mount Carmel Steel Toe Calk Ox Shoes.**

**The Best and Cheapest in the World.**



**Blunt Calk. Seven Sizes.**

**Warranted**  
 to outwear  
 any shoe made.

**WRITE FOR PRICES.**



**Sharp Calk. Six Sizes.**

**Walter W. Woodruff & Sons, Mount Carmel, Conn., U. S. A.**

**BURDEN'S**  
**HORSE SHOES.**

**"Burden Best"**

**Iron.**

**Boiler Rivets.**

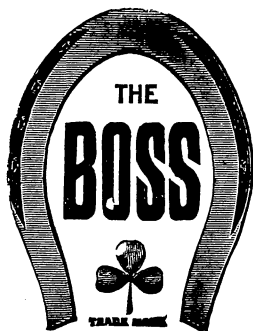
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**Standard Horse Shoe Co.,**  
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**HORSE SHOES,**  
*Light, Medium and Heavy.*  
**MULE SHOES,**  
*Light, Medium and Heavy.*

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JUST TRY THEM and YOU will say they excel all others.

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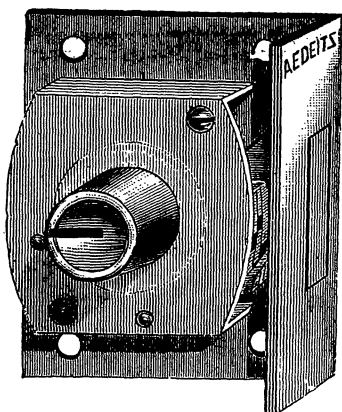
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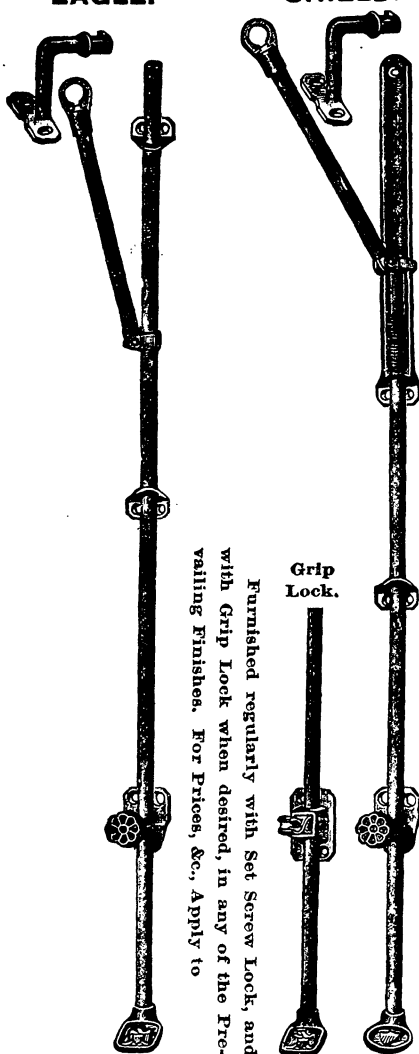
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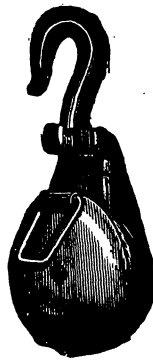
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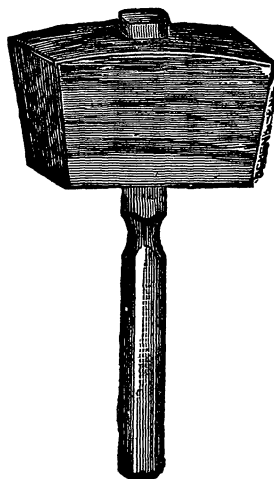
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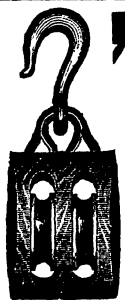
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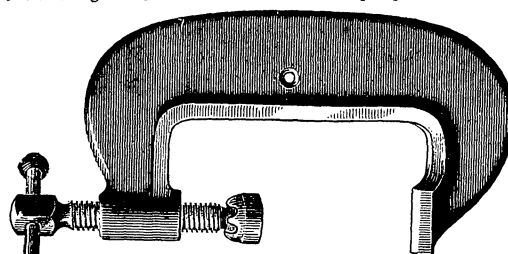
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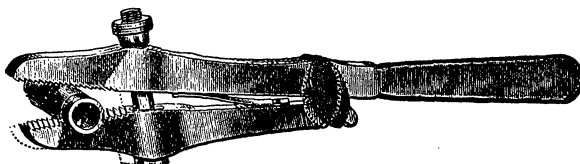
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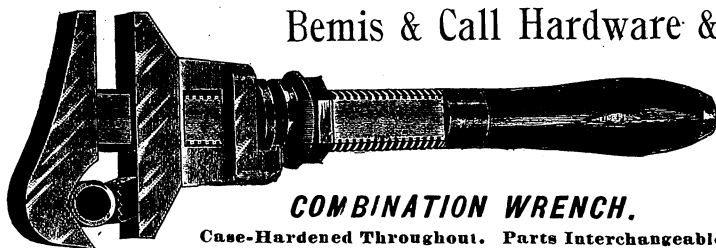
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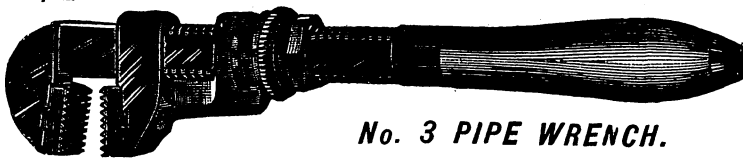


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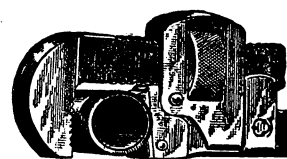


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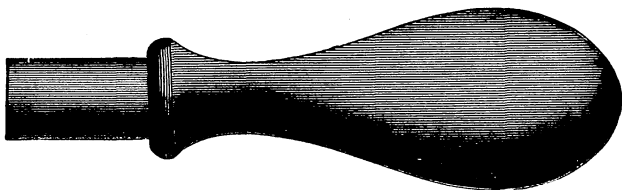
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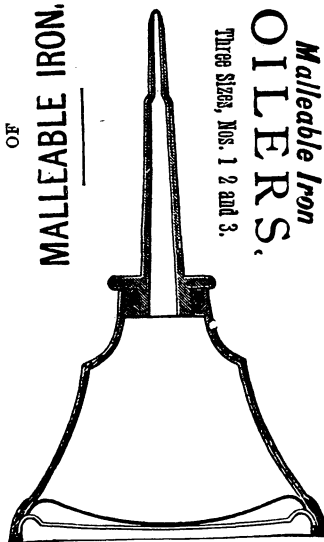


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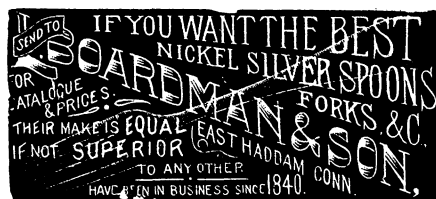
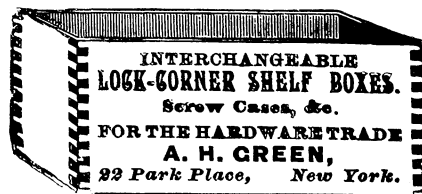
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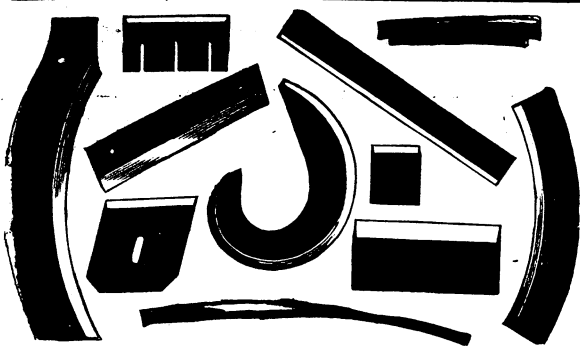
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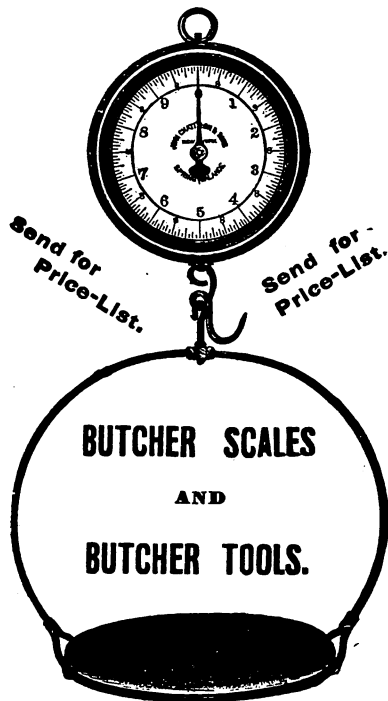
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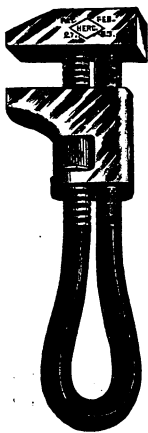
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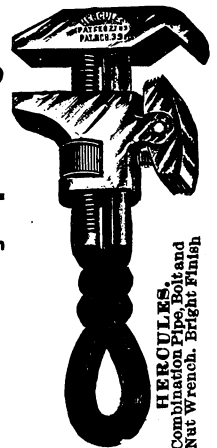
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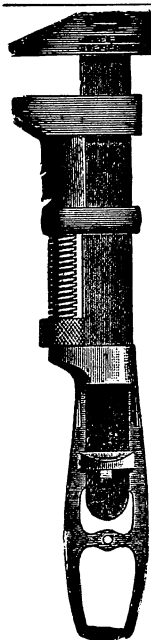
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Solid Lid  
No SOLDERING

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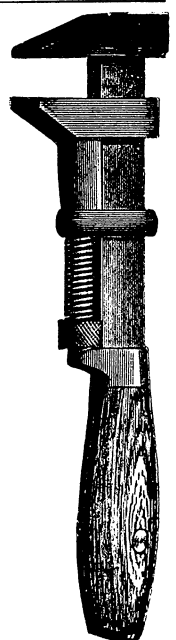
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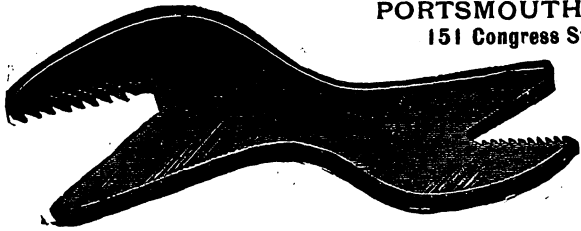
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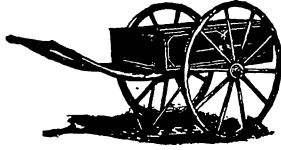
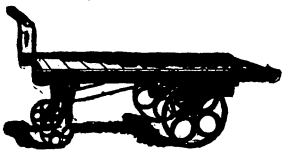
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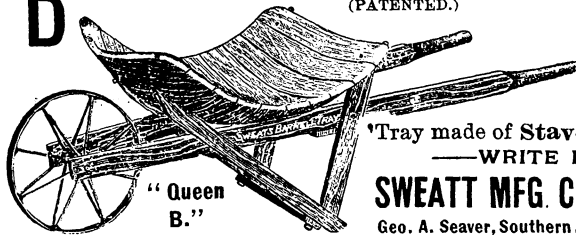
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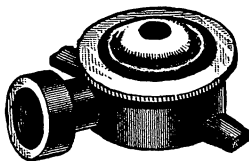


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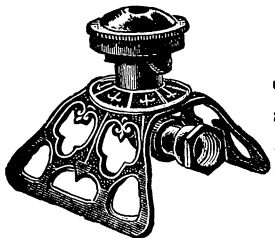


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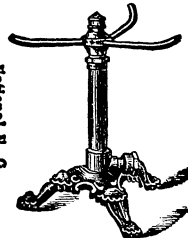


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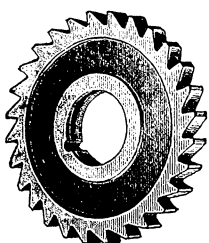
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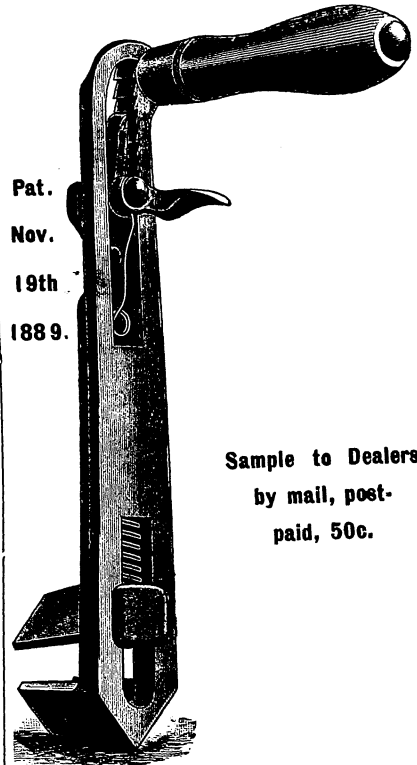
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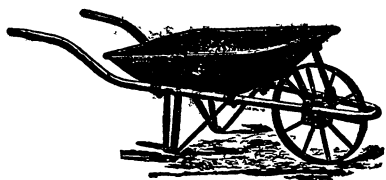
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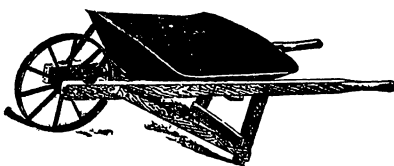


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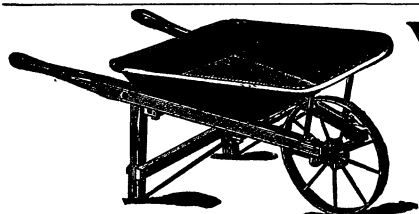
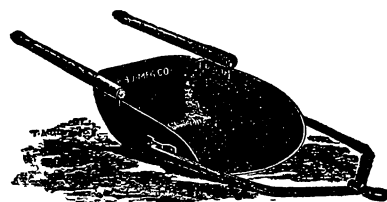
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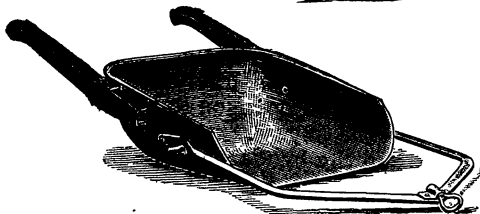


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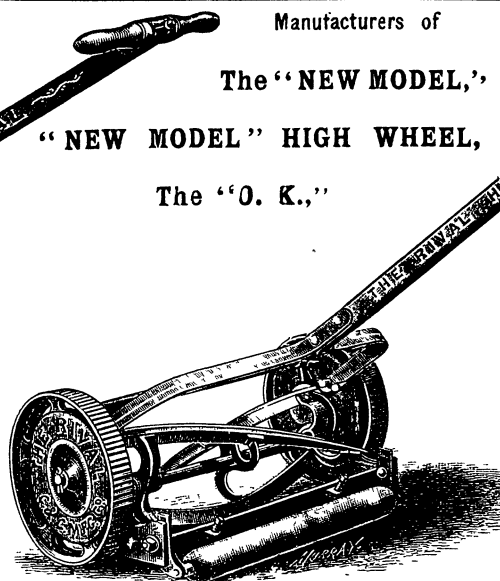
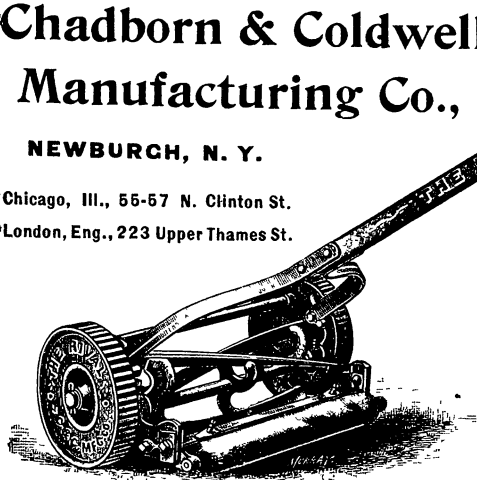
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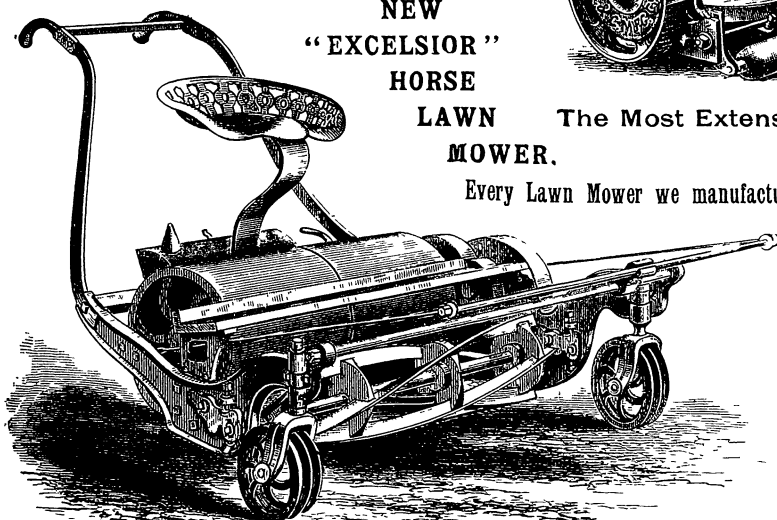
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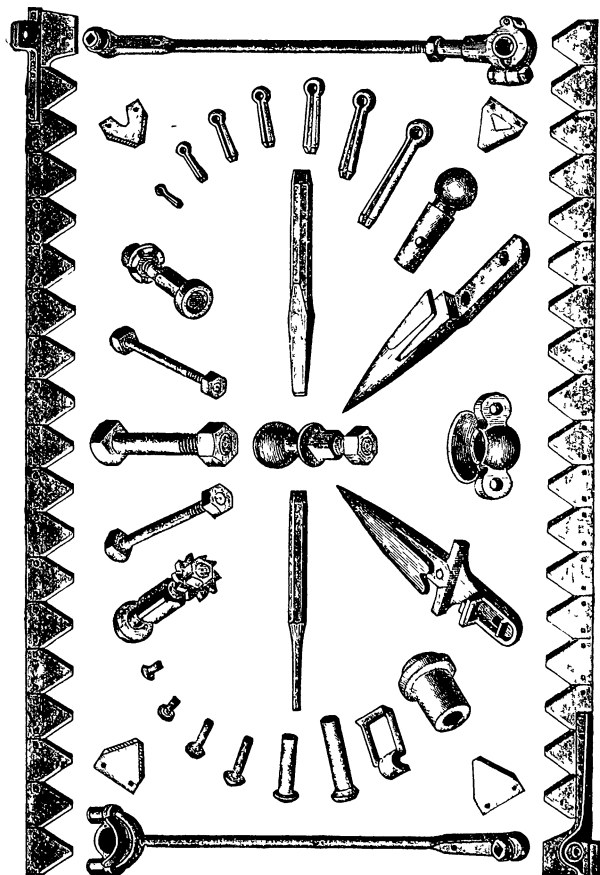
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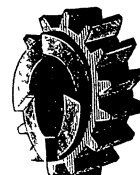
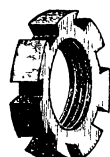
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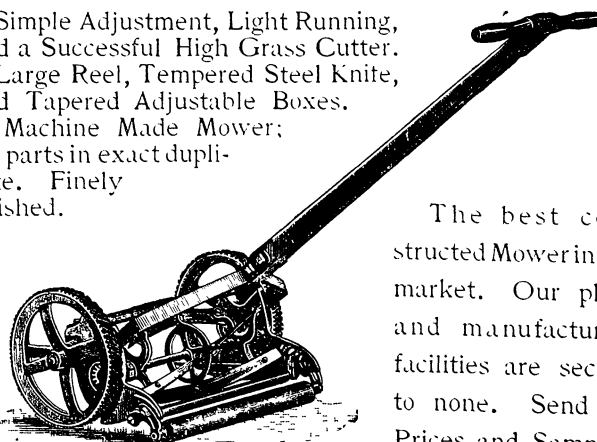
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For the season of 1893, we will offer to the trade the **Pennsylvania** and **Continental** Lawn Mowers unequalled in the excellence of the machine, for the superiority of the work, as well as for their durability, at a price based upon the difference in cost of production, acknowledged to be above the price of the cheaper styles, as their superiority above all makes is conceded. These machines will not only cut the heavy growth grass, but do the most delicate work, insuring a handsome, velvety Lawn.

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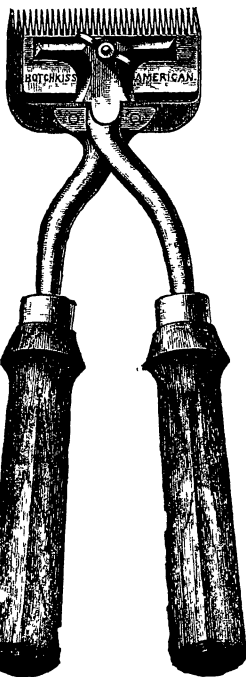
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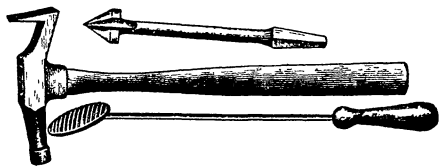
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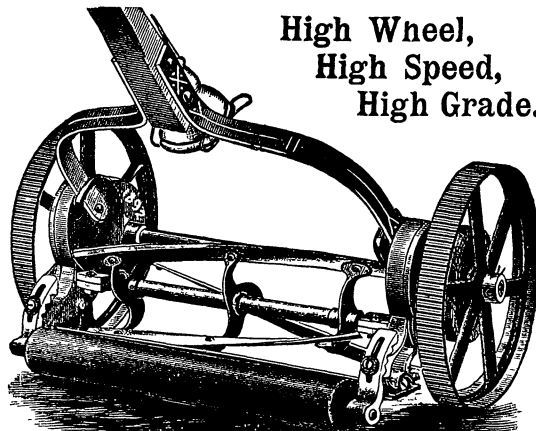
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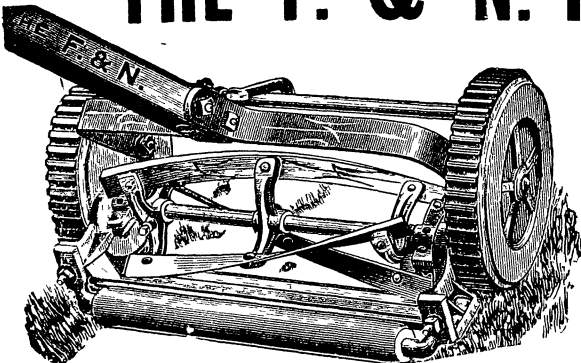
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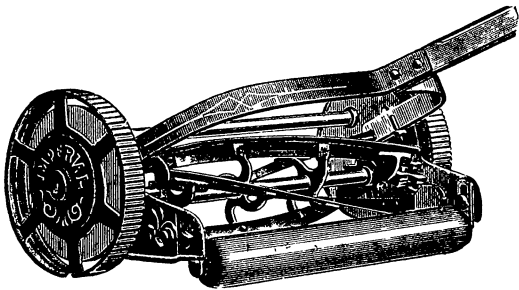


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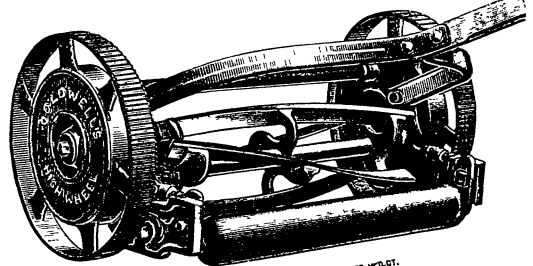
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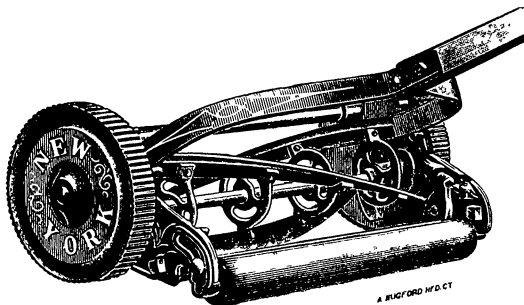
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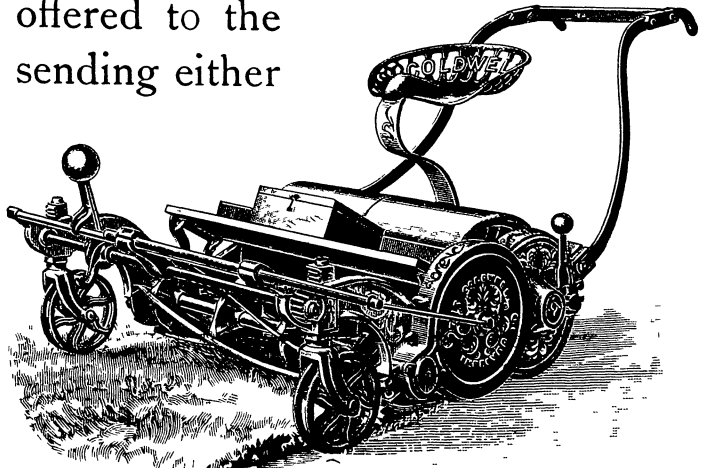


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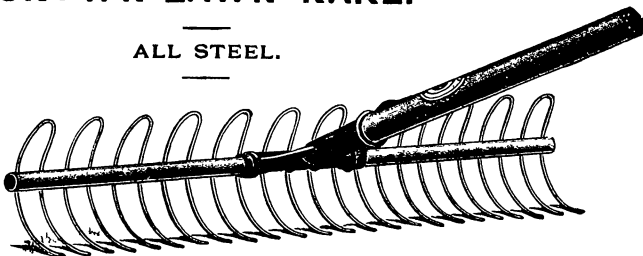


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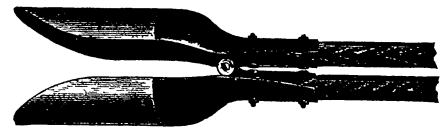
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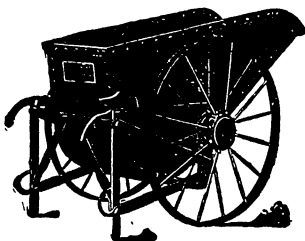
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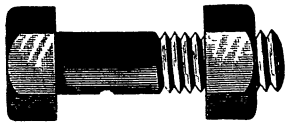
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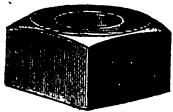
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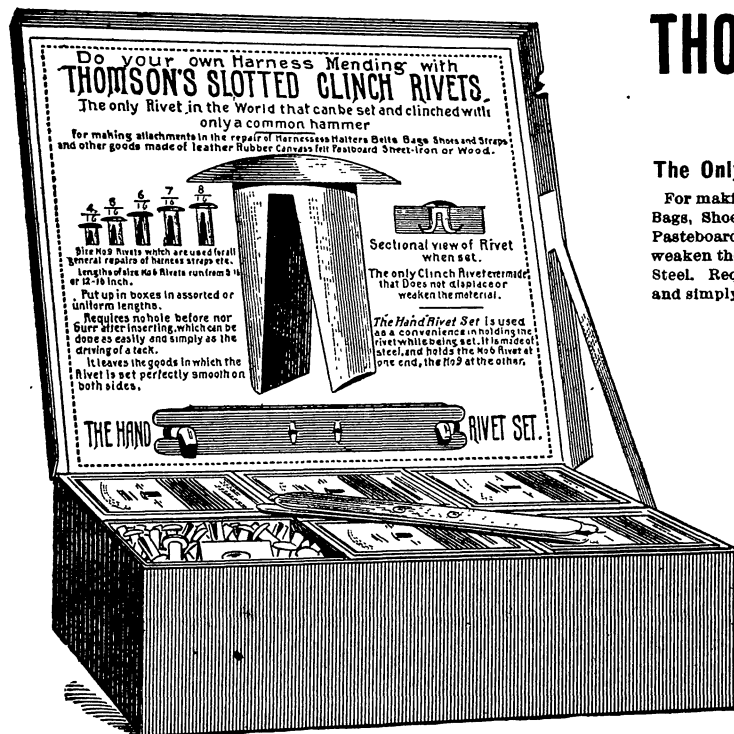
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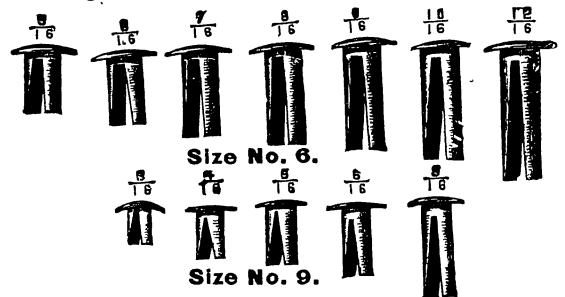
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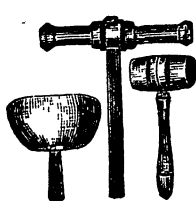


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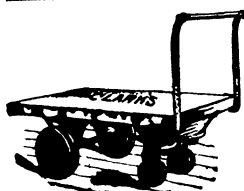
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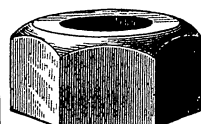
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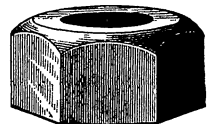
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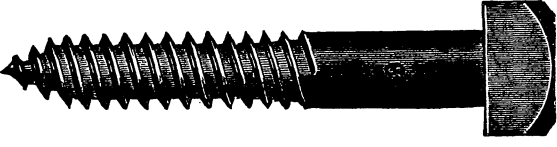
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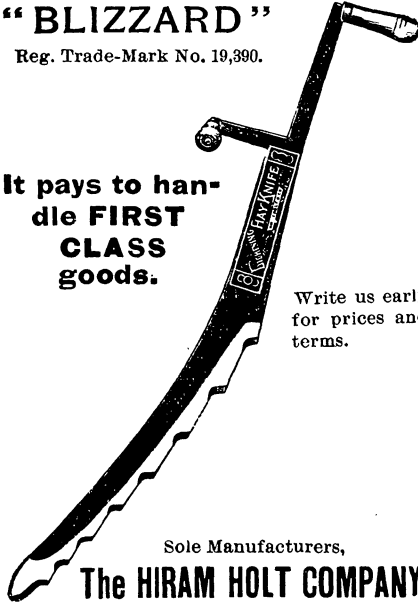
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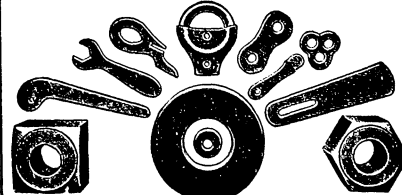
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Wilson, John, Sheffield, England.

**Butts and Hinges.**  
McKinney Mfg. Co., Alleghany, Pa.  
Sabin Machine Co., Montpelier, Vt.  
Stanley Works, New Britain, Conn.  
Tiebout, W. & J., 16 Chambers, N. Y.

**Calipers and Dividers.**  
J. Stevens Arms and Tool Co., Chicopee Falls, Mass.  
Starrett, L. S., Athol, Mass.

**Can Makers' Tools and Machines.**  
Niagara Stamping and Tool Co., Buffalo, N. Y.

**Cann Openers.**  
Meisselbach, A. F. & Bro., Newark, N. J.

**Car Axles.**  
Roberts, A. & P. & Co. Phila.

**Carboy Stands.**  
Hillebrand & Wolf, Philadelphia, Pa.

**Car Wheels.**  
Whitney, A. & Sons, Phila.

**Carriage Hardware, Makers of.**  
Cover's Saddlery Works, Farmer, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Scranton Forging Co., Scranton, Pa.  
Smith, H. D. & Co., Plantsville, Conn.  
Wilcox & Howe Co., Birmingham, Conn.

**Carriage Reloading Tools.**  
Ideal Mfg. Co., New Haven, Conn.

**Casters, Wheel, &c.**  
Clark, G. P., Windsor Locks, Conn.

**Castings, Iron and Steel.**  
Ames Sword Co., Chicopee, Mass.  
Arcade Malleable Iron Co., Worcester, Mass.  
Aschman Steel Casting Co., Thurlow, Pa.  
Booth, The Lloyd, Co., Youngstown, O.  
The Burr & Houston Co., Brooklyn, N. Y.  
Cambria Steel—Cambria Iron Co., Johnstown, Pa.  
Cheney, S. & Son, Manlius, N. Y.  
Chester Steel Casting Co., Phila.  
Congdon Brake Shoe Co., Chicago, Ill.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Eureka Cast Steel Co., Chester, Pa.  
Flagg, Stanley G. & Co., Phila.  
Haight & Clark, Albany, N. Y.  
Hammer & Co., Branford, Conn.  
Herrick, J. A., 284 Pearl St., N. Y.  
Jackson & Woodin Mfg. Co., Berwick, Pa.

Johnson Foundry Co., Johnstown, Pa.  
Johnson, I. G. & Co., Spuyten Duyvil.  
Lima Steel Casting Co., Lima, O.  
Mahoning Fdy. & Mch. Co., Danville, Pa.  
New Castle Steel Casting Co., New Castle, Pa.  
Norristown Steel Co., Norristown, Pa.  
Northwest Malleable Iron Co., Milwaukee, Wis.

Novelty Iron Works, Allentown, Pa.  
Palmer & De Mooy, Cleveland, O.  
Passaic Art Casting Co., Passaic, N. J.  
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.

Pratt & Letchworth, Buffalo, N. Y.  
Sessions Foundry Co., Bristol, Conn.  
Shepard Fdy. Co., Buffalo, N. Y.  
Spencer's, I. S. Sons, Guilford, Conn.  
Springfield Fdy. Co., Springfield.

Standard Fdy. & Mfg. Co., Cleveland, O.  
Standard Steel Casting Co., Thurlow, Pa.  
Syracuse Steel Foundry, Syracuse, N. Y.  
Taylor & Boggis Fdy. Co., Cleveland, O.  
Toften & Hogg Iron & Steel Fdy. Co., Pittsburgh, Pa.

Trenton Mal. Iron Co., Trenton, N. J.  
Union Mfg. Co., 108 Chambers St., N. Y.  
Wetherill, Robt. & Co., Chester, Pa.

**Chains.**  
Bradley & Co., Philadelphia.  
Bridgeport Chain Co., Bridgeport, Conn.  
Wm. H. Haskell Co., Pawtucket, R. I.  
Link-Belt Engineering Co., Phila., Pa.  
McKay, Jas. & Co., Pittsburgh, Pa.

**Chimneys.**  
Phila. Engineering Works, Phila., Pa.

**Chisels, Manufacturers of.**  
Buck Bros., Millbury, Mass.  
White, L. & I. J., Buffalo, N. Y.

**Chucks.**  
Graham Twist Drill & Chuck Co., Detroit, Mich.  
Hoggson & Pettis Mfg. Co., New Haven, Conn.

**Clamps.**  
Hammer & Co., Branford, Conn.  
Le Count, C. W., So. Norwalk, Conn.

**Clipping Machines.**  
McCloskey, E. S., Bridgeport, Conn.  
McCoy, Jos. F. & Co., 26 Warren St.

**Clock Springs, Manuf'rs of.**  
Haley Mfg. Co., Concord, N. H.

**Clothes Line and Wagon Hooks.**  
W. A. Perry & Co., New Bedford, Mass.

**Coal.**  
Wister, Francis, Philadelphia.

**Coke.**  
Frisk, H. C. Coke Co., Pittsburgh, Pa.  
Houston, C. B. & Co., Philadelphia, Pa.  
Rainey, W. J., Cleveland, O.  
Sibell, Geo. H. & Co., Chicago, Ill.  
Wister, Francis, Philadelphia, Pa.

**Collections.**  
Hardware Board of Trade (Limited) 4 and 6 Warren, N. Y.

**Conveying Machinery.**  
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.  
Jeffrey Mfg. Co., Columbus, O.  
Link Belt Engineering Co., Phila., Pa.

**Copper.**  
Ames Sword Co., Chicopee, Mass.  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Hendricks Bros., 49 Cliff, N. Y.  
New Haven Copper Co., 284 Pearl, N. Y.  
Randolph & Clowes, Waterbury, Conn.  
Rome Brass and Copper Works, Rome, N. Y.  
Wister, Francis, Philadelphia, Pa.

**Coppersmith.**  
Emory, P. P. Mfg. Co., Springfield, Mass.

**Cordage.**  
Elizabethport Cordage Co., 46 South, Samson Cordage Works, Boston, Mass.  
Travers Bros. Co., 107 Duane St., N. Y.

**Cork Screws.**  
Williamson, C. T. Wire Novelty Co., Newark, N. J.

**Corrugated Furnaces.**  
Continental Iron Wks, Brooklyn, N. Y.

**Corrugated Iron.**  
Cambridge Roofing Co., Cambridge, O.  
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.

**Countersinks.**  
Smethport Machine Co., Ltd., Smethport, Pa.

**Counting Machines.**  
Osborn, G. Edw. & Co., New Haven, Ct.

**Coupling.**  
Almond, T. R., Brooklyn, N. Y.

**Coverings, Boiler and Pipe.**  
Johns, H. W. Mfg. Co., 87 Maiden Lane.

**Cranes.**  
Allentown Rolling Mills, Allentown, Pa.  
Colliat, Victor, Detroit, Mich.  
Detroit Foundry Equipment Co., Detroit, Mich.

**Cutlery, Manufacturers of.**  
Amer. Cutlery Co., Chicago, Ill.  
Curley, J. & Bro., 6 Warren St., N. Y.  
Dams, Stoddard & Kendall, Boston, Mass.  
Electric Cutlery Co., 113 Chambers, N. Y.  
Goodell Co., Antrim, N. H.  
Landers, Frary & Clark, New Britain, Conn.  
Meriden Cutlery Co., Meriden, Conn.  
Northampton Cutlery Co., Northampton, Mass.  
Wilson, John, Sheffield, England.

**Curry Combs.**  
Kohler, F. E. & Co., Canton, O.  
Noyes, B. B. & Co., Greenfield, Mass.

**Cutlery, Importers of.**  
Gurney, Fred B., 116 Chambers St., N. Y.  
Stickles, Sweet & Lyon, 35 Barclay, N. Y.

**Cutlery, Manufacturers of.**  
Amer. Cutlery Co., Chicago, Ill.  
Curley, J. & Bro., 6 Warren St., N. Y.  
Dams, Stoddard & Kendall, Boston, Mass.

**Cutlery, Manufacturers of.**  
Electric Cutlery Co., 113 Chambers, N. Y.  
Goodell Co., Antrim, N. H.  
Landers, Frary & Clark, New Britain, Conn.  
Meriden Cutlery Co., Meriden, Conn.  
Northampton Cutlery Co., Northampton, Mass.  
Wilson, John, Sheffield, England.

**Dipper Handles.**  
Home Novelty Mfg. Co., St. Louis, Mo.

**Dog Collars.**  
Chapman Mfg. Co., Meriden, Conn.

**Door Checks.**  
Utility Door Check Co., Chicago, Ill.

**Door Knobs.**  
Bardley, J., 149 & 151 Baxter St., N. Y.

**Drilling Machines.**  
Boydston & Plummer, Worcester, Mass.  
Brady Mfg. Co., Brooklyn, N. Y.  
Buffalo Forge Co., Buffalo, N. Y.  
Burnham, Geo. & Co., Worcester, Mass.  
Champion Blower and Forge Co., Lancaster, Pa.

**Drilling Machines.**  
Colburn, A. L., New Haven, Conn.  
Dallett, Thos. H. & Co., Philadelphia.  
Dwight Slate Machine Co., Hartford, Conn.

**Drilling Machines.**  
Halsey, Jas. T., Philadelphia, Pa.  
Illinois Iron and Bolt Co., Carpentersville, Ill.  
Millers Falls Co., 98 Reade, N. Y.

**Drilling Machines.**  
Norton & Jones Machine Tool Works, Plainville, Conn.  
Quint, A. D., Hartford, Conn.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Sibley & Ware, So. Bend Ind.

**Drilling Machines.**  
Sikourney Tool Co., Hartford, Conn.  
Silver Mfg. Co., Salem, O.  
Smith Friction Drill & Tool Co., Boston, Mass.  
Universal Radial Drill Co., Cinnc., Ohio.

**Drop Forgings.**  
Belden Mach. Co., New Haven, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Boone, W. C. Mfg. Co., Boonton, N. J.  
Eccles, Richard, Auburn, N. Y.  
Herbrand Co., Fremont, O.

**Drop Forgings.**  
Herrill Bros., 26 First, Brooklyn, E. D.  
Minor & Peck Mfg. Co., New Haven, Ct.  
Phila. Drop Forge Co., Philadelphia, Pa.  
Rhode Island Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Spiers, J. C. & Co., Worcester, Mass.  
Williams, J. H. & Co., Brooklyn, N. Y.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Drop Forgings.**  
Bliss, E. W. & Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Eaton, Geo. H. & Co., Boston, Mass.  
Minor & Peck Mfg. Co., New Haven, Conn.

**Drop Forgings.**  
Stiles & Parker Press Co., Brooklyn, N. Y.  
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

**Dumb Waiters.**  
Storm Mfg. Co., Newark, N. J.

**Dynamite.**  
New York Powder Co., 62 Liberty St., N. Y.

**Dynamites.**  
Lovell Mfg. Co., Ltd., Erie, Pa.  
Zucker & Levett Chemical Co., 10 to 14 Grand St., N. Y.

**Edge Tools, Makers of.**  
Buck Bros., Millbury, Mass.  
Butcher, W. & S., 135 Duane St., N. Y.  
Erie Tool Works, Buffalo, N. Y.  
Plumb, Fayette R., Philadelphia, Pa.  
White, L. & I. J., Buffalo, N. Y.

**Egg Beaters.**  
North Bros. Mfg. Co., Philadelphia.

**Electric Bells and Supplies.**  
Ossander, W. R. & Co., New York.  
Wollensak, J. F., Chicago, Ill.

**Electric Welding.**  
Thomson Electric Welding Co., Boston, Mass.

**Electro-Platers.**  
Boardman, L. & Son, East Haddam, Ct.

**Elevators, Makers of.**  
Link-Belt Engineering Co., Phila., Pa.  
Moline Elevator Co., Moline, Ill.  
Morse, Williams & Co., Phila., Pa.  
Salem F'dry & Mch. Co., Salem, Mass.

**Emery Wheels.**  
Grant Corundum Wheel Mfg. Co., Chester, Mass.  
Michigan Emery Wheel Co., Detroit, Mich.

**Emery Wheels.**  
N. Y. Belting & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.

**Emery Wheels.**  
Springfield Emery Wheel Mfg. Co., Bridgeport, Conn.  
Waltham Emery Wheel Co., Waltham, Mass.

**Enamels.**  
Nubian Iron Enamel Co., Cragin, Ill.

**Engineers and Contractors.**  
Alken Henry, Pittsburgh, Pa.  
Brady Mfg. Co., Brooklyn, N. Y.  
Carten, Henry J., Pittsburgh, Pa.

See Alphabetical Index. Page 110.

- Curtis, Gram, Pittsburgh, Pa.**  
**Herrick, J. A., 254 Pearl St., N. Y.**  
**Kennedy, Julian, Pittsburgh, Pa.**  
**Laughlin, Alex. & Co., Pittsburgh, Pa.**  
**Lean, D. B. & Co., Pittsburgh, Pa.**  
**McClure & Amisler, Pittsburgh, Pa.**  
**Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.**  
**Roberts, Frank C., Philadelphia, Pa.**  
**Smith, M. V., Pittsburgh, Pa.**  
**Smythe, S. R. Co., Incorporated Pittsburgh, Pa.**  
**Swindell, W. & Bros., Pittsburgh, Pa.**  
**Wilkie, Bothwell & Co., Ltd., Pittsburgh, Pa.**  
**Zellweger, J., St. Louis, Mo.**
- Engines, Gas.**  
**Otto Gas Engine Works, Phila., Pa.**
- Engines, Steam, Makers of.**  
**American Engine Co., Bound Brook, N. J.**  
**Buckeye Engine Co., Salem, Ohio.**  
**Cleveland & Harwick, Erie, Pa.**  
**Leffel, W. C. Co., Springfield, O.**  
**Norwalk Iron Works Co., So. Norwalk, Conn.**  
**Shipman Engine Co., Boston, Mass.**  
**Southwark Foundry and Machine Co., Phila., Pa.**  
**Tod, William & Co., Youngstown, O.**  
**Wetherill, Robt. & Co., Chester, Pa.**
- Exhaust Tumblers.**  
**Sweester, W. A., Brockton, Mass.**
- Expansion Bolts.**  
**Boone, W. C. & Son, Brooklyn, N. Y.**
- Faucets, Self-Measuring.**  
**Lane Bros., Poughkeepsie, N. Y.**
- Faucets, Wooden, Makers of.**  
**Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.**  
**John Sommer's Son, Newark, N. J.**
- Feed-Water Heaters.**  
**Berryman, Jas., Philadelphia, Pa.**  
**Davis, I. B. & Son, Hartford, Conn.**  
**National Pipe Bending Co., New Haven, Conn.**  
**Webster, Warren & Co., Phila., Pa.**  
**Whitlock Coil Pipe Co., Elmwood, Conn.**
- Fencing, Iron and Wire.**  
**Barnum, E. T., Detroit, Mich.**  
**Champion Iron Co., Kenton, O.**  
**Clinton Wire Cloth Co., Clinton, Mass.**  
**DeKalb Fence Co., DeKalb, Ill.**  
**Gilbert & Bennett Mfg. Co., 42 Cliff St., Hartman Mfg. Co., Beaver Falls, Pa.**  
**Kilmer Mfg. Co., Newburgh, N. Y.**  
**Mast, Foss & Co., Cincinnati, O.**  
**The Van Dorn Iron Works Co., Cleveland, O.**  
**Wright & Colton Wire Cloth Co., Worcester, Mass.**  
**Reliance Wire Works Co., Milwaukee, Wis.**
- Files, Importers of.**  
**Moss, F. W., 80 John, N. Y.**
- Files and Rasps, Manufacturers of.**  
**Barnett, G. & H., 41 & 43 Richmond, Phila.**  
**Butcher, W. & S., 135 Duane St., N. Y.**  
**McCaffrey File Co., Philadelphia.**  
**Nicholson File Co., Providence, R. I.**  
**Western File Co. Ltd., Beaver Falls, Pa.**
- Fire Brick, Makers of.**  
**Borgner, Cyrus, Philadelphia, Pa.**  
**Gardner, Jas. & Son, Cumberland, Md.**  
**Kreischer B. & Sons, foot E. Houston, St. Maurer, H. & Son, 420 E. 28d, N. Y.**  
**Renovo Fire Brick and Clay Co., Phila.**  
**Osander Fire Brick Co., Troy, N. Y.**  
**Presbrey Stove Lining Co., Taunton, Mass.**  
**Union Mining Co., Philadelphia, Pa.**  
**Valentine, M. D. & Bro., Woodbridge, N. J.**
- Fire Sets.**  
**Troy Nickel Works, Troy, N. Y.**
- Fishing Tackle.**  
**Dame, Stoddard & Kendall, Boston, Mass.**  
**Enterprise Mfg. Co., Akron, O.**
- Flint and Emery Paper.**  
**Bader, Adamson & Co., Phila., Pa.**
- Floats and Air Chambers.**  
**Springfield Brass Co., Springfield, Mass.**
- Fodder Cutters.**  
**Silver Mfg. Co., Salem, O.**
- Forges, Portable, &c.**  
**Bradley & Co., Syracuse, N. Y.**  
**Bullock Bellows Co., Cleveland, O.**  
**Buffalo Forge Co., Buffalo, N. Y.**  
**Champion Blower & Forge Co., Lancaster, Pa.**  
**Empire Portable Forge Co., Lansingburg, N. Y.**  
**Sturtevant, B. F. Co., Boston, Mass.**
- Forgings, Iron and Steel.**  
**Bethlehem Iron Co., S. Bethlehem, Pa.**  
**Cambria Steel-Cambria Iron Co., Scranton, Pa.**  
**Scranton Forging Co., Scranton, Pa.**
- Foundry, Facing.**  
**Chicago Fdy. Supply Co., Chicago, Ill.**  
**MacKellar Foundry Facing & Supply Co., Quincy, Ill.**  
**Paxson, J. W. & Co., Phila.**  
**S. Obermayer Co., Cincinnati, O.**  
**Smith, J. D. Fdy. Supply Co., Cinnc., O.**  
**Whitehead Bros. Co., 517 W. 15th St., N. Y.**
- Foundry Riddles.**  
**Estey, W. S., 65 Fulton, N. Y.**
- Foundry Supplies.**  
**Chicago Fdy. Supply Co., Chicago, Ill.**  
**Collins, Victor, Detroit, Mich.**  
**MacKellar Fdy. Facing & Supply Co., Quincy, Ill.**  
**S. Obermayer Co., Cincinnati, O.**  
**Paxson, J. W. & Co., Philadelphia.**  
**Smith, J. D. Fdy. Supply Co., Cinnc., O.**  
**Whitehead Bros. Co., 517 W. 15th St., N. Y.**
- Friction Clutches.**  
**Moore & White Co., Philadelphia, Pa.**
- Fruit Presses.**  
**Enterprise Mfg. Co., Philadelphia, Pa.**
- Fuel Burners.**  
**Collins, W. S., 45 Drexel Bldg., N. Y.**
- Garden Tools.**  
**Noyes, B. B. & Co., Greenfield, Mass.**
- Gas Producers.**  
**Wood, R. D. & Co., Philadelphia, Pa.**
- Gas & Steam Fitters' Supplies.**  
**Panocast & Maule, Phila., Pa.**
- Gear Cutters.**  
**T. E. Whiton Mach. Co., New London, Conn.**
- Gears.**  
**Boston Gear Works, Boston, Mass.**  
**New Process Raw Hide Co., Syracuse, N. Y.**  
**Poole, Robt. & Son Co., Baltimore, Md.**
- Glass Boards.**  
**Canton Saw Co., Canton, O.**
- Glass Cutters.**  
**Monroe, S. G., Bristol, Conn.**
- Glue.**  
**Bader, Adamson & Co., Phila., Pa.**  
**Kussia Cement Co., Gloucester, Mass.**
- Grass Catchers.**  
**Norton Emery Wheel Co., Worcester, Mass.**
- Grinding and Polishing Machines.**  
**Diamond Mch. Co., Providence, R. I.**  
**Norton Emery Wheel Co., Worcester, Mass.**  
**Washburn Shops, Worcester, Mass.**
- Grindstone Dressing Machinery.**  
**Blake & Johnson, Waterbury, Conn.**
- Grindstones.**  
**Cleveland Stone Co., Cleveland, O.**  
**Huron Grindstone Co., Port Austin, Mich.**
- Gunpowder, Makers of.**  
**Lafin & Rand Powder Co., N. Y.**
- Hand Carts.**  
**Lansing Wheelbarrow Co., Lansing, Mich.**
- Handles.**  
**New Process Raw Hide Co., Syracuse, N. Y.**  
**New York Mallet and Handle Wks., 456 E. Houston St., N. Y.**
- Hangers, Door.**  
**Coburn Trolley Track Mfg Co., Holyoke, Mass.**  
**Coleman Hdw. Co., Chicago, Ill.**  
**Lane Bros., Poughkeepsie, N. Y.**  
**Victor Mfg. Co., Newburyport, Mass.**
- Hardware Comm'n Merchants.**  
**Doscher, Martin, 88 Chambers, N. Y.**  
**Jacobus, W. H., 90 Chambers, N. Y.**
- Hardware Manufacturers.**  
**Hotchkiss, E. S., Bridgeport, Conn.**  
**Stearns, E. C. & Co., Syracuse, N. Y.**  
**Union Mfg. Co., 103 Chambers, N. Y.**  
**Yale & Towne Mfg. Co., Stamford, Conn.**
- Hardware Mfrs. Agents.**  
**Bingham, W. Co., Cleveland, O.**  
**Graham, John H. & Co., 113 Chambers, MoCo, Jos. F. Co., 28 Warren St., N. Y.**  
**Sickles, Sweet & Lyon, 35 Barclay, N. Y.**  
**Surplus, Dunn & Alder, 97 Chambers St., New York.**  
**Underhill, Clinch & Co., 94 Chambers St., N. Y.**
- Hardware Specialties.**  
**Acme Shear Co., Bridgeport, Conn.**  
**Bailey, F. E. & Co., Chicago, Ill.**  
**Heiden Machine Co., New Haven, Conn.**  
**Copeland Hdw. Mfg. Co., Worcester, Mass.**  
**Ellis, Geo. D. & Sons Co., Phila., Pa.**  
**Silrich Hdw. Mfg. Co., Plainville, Conn.**  
**Empire Portable Forge Co., Lansingburg, N. Y.**  
**Enterprise Mfg. Co., Philadelphia, Pa.**  
**Ette & Henger Mfg. Co., St. Louis, Mo.**  
**Hart, H. O. Mfg. Co., Detroit, Mich.**  
**Henn, A. S. & Co., New Haven, Conn.**  
**Home Novelty Mfg. Co., St. Louis, Mo.**  
**North Bros. Mfg. Co., Philadelphia, Pa.**  
**Shepard, Sidney & Co., Buffalo, N. Y.**  
**Welland, Chas., 143 Chambers St., N. Y.**  
**Wire Goods Co., Worcester, Mass.**  
**Underhill, Clinch & Co., 94 Chambers Street, N. Y.**
- Hardware, Yacht and Ship.**  
**Ferdinand, L. W. & Co., Boston, Mass.**
- Harness Snaps.**  
**Covert Mfg. Co., West Troy, N. Y.**  
**Cover's Saddlery Wks., Farmer, N. Y.**  
**Fitch, W. & E. T., New Haven, Conn.**
- Hay Knives.**  
**Holt, Hiram, Co., E. Wilton, Me.**
- Holisting Machines.**  
**Jox, Alfred & Co., 314 Green, Phila.**  
**Jrow, Holisting & Conveying Mch. Co., Cleveland, Ohio.**  
**Copeland & Bacon, 85 Liberty St. N. Y.**  
**Fulton Iron & Engine Wks., Detroit, Mich.**  
**Harrington, E., Son & Co., Phila.**  
**Lane Bros., Poughkeepsie, N. Y.**  
**Lidgerwood Mfg. Co., 96 Liberty, N. Y.**  
**Marls & Beekley, Philadelphia.**  
**Moore Mfg. & Fdy. Co., Milwaukee, Wis.**  
**Morse, Williams & Co., Phila.**  
**Sellers, Wm. & Co., Phila. and N. Y.**  
**Spedel, J. G., Reading, Pa.**  
**Yale & Towne Mfg. Co., Stamford, Ct.**
- Hollow-Ware.**  
**Bronson Supply Co., Cleveland, Ohio.**  
**Cleveland Stamping & Tool Co., Cleveland, O.**  
**Stuart & Peterson Co., Phila., Pa.**
- Home Instruction.**  
**Correspondence School of Mechanics, Scranton, Pa.**
- Horse and Barbers' Clippers.**  
**Hotchkiss, E. S., Bridgeport, Conn.**
- Horse Nails, Makers of.**  
**Ausable Horse Nail Co., 4 Warren, N. Y.**  
**National Horse Nail Co., Vergennes, Vt.**
- Horse Shoes, Makers of.**  
**Bryden Horse Shoe Co., Catsaugua, Pa.**  
**Diamond State Iron Co., Wilmington, Del.**  
**Old Dominion Iron & Nail Works Co., Richmond, Va.**  
**Phoenix Horse Shoe Co., Poughkeepsie, N. Y.**  
**Rhode Island Perkins Horse Shoe Co., Providence.**  
**Standard Horse Shoe Co., Boston, Mass.**  
**The Burden Iron Co., Troy, N. Y.**
- Hose.**  
**N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.**
- Hydrants, &c.**  
**McLean, John, 296 & 298 Monroe, N. Y.**
- Hydraulic Jacks.**  
**Dudgeon, Richard, 24 Columbia, N. Y.**  
**Watson & Stillman, 204 E. 43d, N. Y.**
- Ice-Cream Freezers.**  
**North Bros. Mfg. Co., Phila., Pa.**  
**Packer, C. W., Philadelphia, Pa.**  
**Peerless Freezer Co., Cincinnati, Ohio.**  
**Shepard Hdw. Co., Buffalo, N. Y.**  
**Shenard, Bradley & Co., Phila., N. Y.**  
**White Mountain Freezer Co., Nashua, N. H.**
- Ice Picks.**  
**Copeland Hdw. Mfg. Co., Worcester, Mass.**
- Ice Shavers.**  
**Enterprise Mfg. Co., Philadelphia, Pa.**
- Injectors.**  
**Jenkins Bros., New York**
- Insurance, Boiler.**  
**Hartford Steam Boiler Inspection & Insurance Co.**
- Iron and Steel, Swedish.**  
**Lundberg, Gustaf, Boston, Mass.**  
**Milne, A. & Co., 1 Broadway, N. Y.**  
**Pace, Newell & Co., Boston, Mass.**
- Iron Commission Brokers.**  
**Cason, Wm. R. & Co., Philadelphia.**  
**Corning, Edw. & Co., 29 B'way, N. Y.**  
**Cotton, Bradley & Co., Philadelphia.**  
**Etting, Edw. J., Philadelphia.**  
**Hogan, John L. & Co., Philadelphia, Pa.**  
**Hoffman, J. W. & Co., Philadelphia.**  
**Levis, Henry & Co., Philadelphia.**  
**Keeley, Jerome & Co., Philadelphia.**  
**Lee, J. Tatnall & Co., Philadelphia.**  
**Mohr, J., 430 Walnut, Philadelphia.**  
**Mann, E. R. & Co., Philadelphia.**  
**Pilling & Crane, Philadelphia, Pa.**  
**Sibell, Geo. H. & Co., Chicago, Ill.**  
**Wister, L. & R. & Co., Phila., Pa.**
- Iron Ore.**  
**Naylor & Co., 45 Wall, N. Y.**  
**Pickands, Brown & Co., Chicago, Ill.**  
**Pullman, J. Wesley, Phila., Pa.**
- Iron, Merchants.**  
**Barnes, C. E. & Co., Philadelphia, Pa.**  
**Borden & Lovell, 70 West, N. Y.**  
**Busenius & Cunliffe, Philadelphia.**  
**Corning Edw. & Co., 29 B'way, N. Y.**  
**Cox, Justice, Jr., Philadelphia.**  
**Cotton, Bradley & Co., Philadelphia.**  
**Hoffman, J. W. & Co., Philadelphia.**  
**Judson, C. F., 27 Water, St., N. Y.**  
**Leonard, J., 446 West St., N. Y.**  
**Naylor & Co., 45 Wall St., N. Y.**  
**Nicolls, Wheeler & Co., Philadelphia.**  
**Ogden & Wallace, 85 Elm St., N. Y.**  
**Pace, Newell & Co., Boston, Mass.**  
**Pickands, Brown & Co., Cleveland, O.**  
**Pier, Wm. & Co., 24 West, N. Y.**  
**Richards, D. W. & Co., 88 Mangin St., N. Y.**  
**Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.**  
**Whitney, A. R. & Co., 17 B'way, N. Y.**  
**Wilson, E. H. & Co., Philadelphia.**
- Iron, Importers.**  
**Abbott, Jere & Co., N. Y. and Boston.**  
**Judson, B. F., 457 Water St., N. Y.**  
**Lundberg, Gustaf, Boston, Mass.**
- Iron, Sheet, Manufacturers of.**  
**Attn Iron & Steel Co., Bridgeport, O.**  
**Cambridge Iron & Steel Co., Cambridge, Ohio.**  
**Wheeling Steel & Iron Co., Wheeling, W. Va.**  
**W. Dewees Wood Co., Lim., Pittsburgh.**
- Ironwork, Ornamental.**  
**Barnum, E. T., Detroit, Mich.**  
**Champion Iron Co., Kenton, O.**  
**Ludlow-Saylor Wire Co., St. Louis, Mo.**  
**Mast, Foot & Co., Springfield, O.**  
**O. Sneed & Bibb, Louisville, Ky.**  
**The Van Dorn Iron Works Co., Cleveland, O.**
- Keys.**  
**Wollensak, J. F., Chicago, Ill.**
- Ladies.**  
**Detroit Fdy. Equipment Co., Detroit, Mich.**
- Lamp Stoves.**  
**Chicago Novelty Mfg. Co., Chicago, Ill.**
- Lanterns.**  
**Dietz, R. E. & Co., 60 Lighthouse, N. Y.**  
**Steam Gauge & Lantern Co., Syracuse, N. Y.**
- Lathes.**  
**Finney & Rhodes, Hartford, Conn.**  
**Millers Falls Co., 93 Kease, N. Y.**  
**Sebastian Lath Co., Cincinnati, O.**  
**Sebastian, May & Co., Sidney, O.**  
**Seneca Falls Mfg. Co., Seneca Falls, N. Y.**
- Lathing.**  
**Clinton Wire Cloth Co., St. Louis, Mo.**  
**N. J. Wire Cloth Co., Trenton, N. J.**
- Lawn Mowers.**  
**Bingham, W. Co., Cleveland, O.**  
**Bial Mfg. Co., Springfield, Mass.**  
**Chadborn & Coldwell Mfg. Co., Newburg, N. Y.**  
**Colewell Lawn Mower Co., Newburg, N. Y.**  
**F. & N. Mfg. Co., Richmond, Ind.**  
**Foss, G. S. Co., Springfield, Ind.**  
**Henley, M. C., Richmond, Ind.**  
**Lape, W. E., Syracuse, N. Y.**  
**Mast, Foss & Co., Springfield, O.**  
**Stearns, E. C. & Co., Syracuse, N. Y.**  
**Supplies Hdw. Co., Phila., Pa.**  
**Surplus, Dunn & Alder, 97 Chambers St., N. Y.**  
**Wilsn Whiteley & Co., Springfield, O.**
- Lawn Rakes.**  
**Gibbs Mfg. Co., Canton, O.**  
**Graham, John H. & Co., 111 Chambers St., New York.**
- Lawn Sprinklers.**  
**Blair Mfg. Co., Springfield, Mass.**  
**Ette & Henger Mfg. Co., St. Louis, Mo.**
- Lawn Sweepers.**  
**Lape, W. E., Syracuse, N. Y.**
- Lemon Squeezers.**  
**Ripley Mfg. Co., Unionville, Conn.**
- Letter Boxes.**  
**Merriam Mfg. Co., Durham, Conn.**
- Letters.**  
**Tablet & Ticket Co., Chicago, Ill.**
- Levels.**  
**Richardson, C. F. & Son Athol, Mass.**
- Locks & Knobs, Manufacturers of.**  
**Delts, A. E., 87 Chambers, N. Y.**  
**Reading Hdw. Co., Reading, Pa.**  
**Smith & Egge Mfg. Co., Bridgeport, Conn.**  
**Warner Lock Co., Chicago, Ill.**  
**Yale & Towne Mfg. Co., Stamford, Conn.**
- Machinery.**  
**Am. Tool Works, Cleveland, Ohio.**  
**Barnes, W. F. & John, Rockford, Ill.**  
**Becker, Jno. Mfg. Co., Fitchburg, Mass.**  
**Bement, Miles & Co., Philadelphia, Pa.**  
**Bigelow, C. E., 45 Day, N. Y.**  
**Bigelow & Keeler Mfg. Co., St. Louis.**  
**Birmingham Iron Foundry, Birmingham, Conn.**  
**Bliss, E. W. Co., Brooklyn, N. Y.**  
**Bowsher, N. P., 8. Beers, Ind.**  
**Briggs, Marvin, 12 Broadway, N. Y.**  
**Brown & Sharpe Mfg. Co., Providence, R. I.**  
**Carlin's Sons, Thos., Allegheny, Pa.**  
**Clapp, Geo. M., agt., 74 Cortlandt, N. Y.**  
**Coulter & McKenzie Mch. Co., Bridgeport, Conn.**  
**Cruikshank, D. B., Providence, R. I.**  
**Davis, W. P., Rochester, N. Y.**  
**Detrick & Harvey Mch. Co., Baltimore, Md.**  
**Finney & Rhodes, Hartford, Conn.**  
**Fitchburg Mch. Works, Fitchburg, Mass.**  
**Garvin Mch. Co., Lighthouse & Canal Sts.**  
**Gould & Eberhardt, Newark, N. J.**  
**Harrington, E. son & Co., Phila., Pa.**  
**Henderson Machine Tool Co., Phila., Pa.**  
**Hendy Machine Co., Torrington, Conn.**  
**Hill, Clarke & Co., Boston, Mass.**  
**Ingersoll Milling Machine Co., Rockford, Ill.**  
**Johnson, Israel H., Jr., & Co., Phila.**  
**Jones & Lamson Mch. Co., Springfield, Vt.**  
**Lodge & Davis Mch. Tool Co., Cincinnati, O.**  
**Lodge & Shipley Mch. Tool Works, Cincinnati, O.**  
**Lovegrove & Co., Philadelphia, Pa.**  
**McCabe, J. J., 68 Cortlandt, N. Y.**  
**Mechanists Supply Co., Rochester, N. Y.**  
**Manville, E. J. Mch. Co., Waterbury, Conn.**  
**Newark Mch. Tool Works, Newark, N. J.**  
**New Haven Mfg. Co., New Haven, Conn.**  
**New York Mach'ny Depot, N. Y.**  
**Pedrick & Ayer, Philadelphia, Pa.**  
**Pittsburgh Mfg. Co., Pittsburgh, Pa.**  
**Place, Geo., 120 Broadway, N. Y.**  
**Poole, Robt. & Son C., Baltimore, Md.**  
**Power Planer Co., Worcester, Mass.**  
**Pratt & Whitney Co., Hartford, Conn.**  
**Prentiss Tool & Supply Co., N. Y.**  
**Scranton Supply & Mch'ry Co., Scranton, Pa.**  
**Sellers, Wm. & Co., Phila.**  
**Seyfert's Sons L. F., Philadelphia, Pa.**  
**Stephens, J. & Co., Cincinnati, O.**  
**Stow Flexible Shaft Co., Ltd., Phila.**  
**Toomey, Frank, Philadelphia, Pa.**  
**Wetherill, Robert & Co., Chester, Pa.**  
**Wilson, W. A., Rochester, N. Y.**  
**Woodruff Mfg. Co., Hartford, Conn.**
- Machinery for Hardware Manufacture.**  
**Adt, Jno. & Son, New Haven, Conn.**
- Machine Knives.**  
**Long Coes & Co., Worcester, Mass.**
- Machine Tools.—See Machinery.**
- Machine Work.**  
**Angus, C. H. Albany, N. Y.**
- Machinists' Scales.**  
**Coffin & Lighton, Syracuse, N. Y.**  
**Starrett, L. S., Athol, Mass.**
- Machinists' Tools and Supplies.**  
**Brown & Sharpe Mfg. Co., Providence, R. I.**  
**Sellers, Wm. & Co., Inc., Phila.**
- Mallets.**  
**N. Y. Mallet & Handle Works, N. Y.**
- Measuring Tapes.**  
**Lufkin Rule Co., Saginaw, Mich.**
- Meat Cutters.**  
**Enterprise Mfg. Co., Philadelphia, Pa.**  
**Lloyd, W. J. Mfg. Co., Phila., Pa.**
- Metals.**  
**Fearing, Wm. S., 100 Chambers, N. Y.**  
**Hendricks Bros., 49 Cliff, N. Y.**  
**Naylor & Co., 45 Wall, N. Y.**  
**Simpers, Colling & Co., Phila., Pa.**
- Metal Brokers.**  
**American Metal Co., N. Y.**
- Metalburgists.**  
**Britton, J. Blodgett, Phila.**
- Metal Saws.**  
**Ehrhardt, Gastave & Sons, Pittsburgh, Pa.**  
**Q & C Co., Chicago, Ill.**
- Milk Cans and Trimmings.**  
**Shepard, Sidney & Co., Buffalo, N. Y.**
- Milling Machines.**  
**Ingersoll Milling Machine Co., Rockford, Ill.**
- Mining Knives.**  
**Palmer Hdw. Mfg. Co., Troy, N. Y.**
- Mine Lamps.**  
**Darby, Edw. & Sons Phila. Pa.**  
**Leonard, E. E., Scranton, Pa.**  
**Leonard, T. F., Scranton, Pa.**
- Mining Machinery.**  
**Frazer & Chalmers, Chicago, Ill.**
- Mining Screens.**  
**Harrington & King Perforating Co., Chicago, Ill.**
- Molding Sand.**  
**Chicago Foundry Supply Co., Chicago, Ill.**  
**Obermayer, S. Co., Cincinnati, O.**



- Parson, J. W. & Co., Phila.  
Whitehead Bros. Co., 517 W. 15th St.  
N. Y.
- Nail Keg Heading.**  
Sayers, H. & Son, Sherwood, Mich.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail Machinery.**  
P. & B. Nail Mch. Co., St. Louis, Mo.
- Nails (Cut) and Spikes.**  
Borden & Lovell, 70 West N. Y.  
Cumberland Nail & Iron Co., Phila.  
Oxford Iron Co., 81 W. Washington, N.  
Pottstown Iron Co., Pottstown, Pa.  
Riverside Iron Works, Wheeling, W.  
Va.  
Stebbins, C. J., 108 Reade, N. Y.
- Nickel Platers' Supplies.**  
Zucker & Levert Chemical Company,  
10 to 14 Grand St., N. Y.
- Norway Shapes, Rollers of.**  
Rowland, W. A. & Harvey, Frank-  
ford, Philadelphia
- Nut Machines.**  
Dunham Nut Mch. Co., Unionville, O.
- Nuts, Bolts, &c., Makers of.**  
American Bolt Co., Lowell, Mass.  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Haskell, Wm. H. Co., Pawtucket, R. I.  
Port Chester Bolt and Nut Co., Port  
Chester, N. Y.  
Russell, Burdall & Ward, Port Chester  
Rhode Island Tool Co., Providence, R. I.  
Sternberg, J. H. & Son, Reading, Pa.  
Wilson, J. Fred., Worcester, Mass.  
Wm. H. Haskell Co., Pawtucket, B. I.
- Oilers.**  
Hammer & Co., Branford, Conn.  
Williams H. A. Mfg. Co., Boston, Mass.
- Oil Stones.**  
Pike Mfg. Co., Pike Station, N. H.
- Ore Sampling Machines.**  
Fraser & Chalmers, Chicago, Ill.
- Ores.**  
Wister, Francis, Philadelphia, Pa.
- Or Shoes.**  
Scranton Forging Co., Scranton, Pa.  
Woodruff, Walter W. & Sons, Mt. Car-  
mel, Conn.
- Packing.**  
N. Y. Belting & Packing Co. Ltd., N. Y.  
Billington, Jas. H. & Co., Phila., Pa.
- Paddocks.**  
Ames Sword Co., Chicopee, Mass.  
Fram, E. T., Lancaster, Pa.  
Hillebrand & Wolf, Phila., Pa.  
Miller Lock Co., Philadelphia, Pa.  
Rothacker & Schultz, Philadelphia, Pa.
- Paint.**  
Detroit Graphite Mfg. Co., Detroit,  
Mich.  
Dixon-Jos. Crucible Co., Jersey City, N. J.
- Paint Burners.**  
Dangler Stove & Mfg. Co., Cleveland, O.
- Patent Solicitors.**  
Ashley, J. A., Washington, D. C.  
Fitzgerald, S. C., Washington, D. C.  
Gooch, C. J., Washington, D. C.  
Howson & Howson, Phila. & Washgton.  
Jenner, H. W. T., Washington, D. C.  
Paine & Ladd, Washington, D. C.  
Stocking, E. B., Washington, D. C.
- Perforated Metal.**  
Clinton Wire Cloth Co., Clinton, Mass.  
Harrington & King Perforating Co.,  
Chicago, Ill.
- Phosphor Bronze.**  
Phosphor Bronze Smelting Co., Lim-  
ited, 612 Arch, Philadelphia.
- Phosphor Tin.**  
Crescent Phosphorized Metal Co.,  
Philadelphia, Pa.  
Crosby Steam Gauge & Valve Co., Bos-  
ton, Mass.
- Picks and Mattocks.**  
Plumb, Fayette K., Philadelphia, Pa.
- Pig Iron.**  
Houston, C. B. & Co., Philadelphia, Pa.  
Mann, Edwin R., Philadelphia, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Naylor & Co., 45 Wall, N. Y.  
Pickands, Brown & Co., Chicago, Ill.  
Pilling & Crane, Philadelphia, Pa.  
Wheeling Steel & Iron Co., Wheeling,  
W. Va.
- Pig Iron Storage.**  
Am. Pig Iron Storage Warrant Co., 44  
Wall, N. Y.
- Pipe, Bent.**  
National Pipe Bending Co., New Haven
- Pipe Cutting and Threading Ma-  
chines.**  
Signal & Keeler Mfg. Co., St. Louis, Mo.  
Pancost & Maule, Philadelphia.  
Saunders & Sons, D. Yonkers, N. Y.  
Wells Mch. Works, Fostoria, O.
- Pipe Grips.**  
Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**  
McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas. Makers of.**  
Cumberland Nail & Iron Co., Phila., Pa.  
Donaldson Iron Co., Emsus, Pa.  
Riverside Iron Works, Wheeling, W.  
Va.
- Wood, K. D. & Co., Phila.**
- Plane Irons, Manufacturers of.**  
Buck Bros., Milbury, Mass.
- Planes, Manufacturers of.**  
Stanley Rule & Level Co., N. Y.
- Plate Iron and Steel. Mfrs of.**  
Wood Alan Co., Philadelphia.  
Atma Iron & Steel Co., Bridgeport, O.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Moorhead-McCleane Co., Pittsburgh, Pa.  
McClvaine & Sons, Reading, Pa.  
Pottstown Iron Co., Pottstown, Pa.  
Pottsville Iron & Steel Co., Pottsville,  
Pa.
- Singer, Nickle & Co., Pittsburgh, Pa.**  
The Mahoning Valley Iron Co., Youngs-  
town, O.
- Wellman Iron & Steel Co., Thurlow, Pa.**  
Alan Wood Co., Philadelphia.
- Plating, Nickel, Brass and  
Silver.**  
Angus, C. H. Albany, N. Y.  
Shepard Hdw. Co., Buffalo, N. Y.  
Wilmot & Hobbs Mfg. Co., Bridgeport,  
Conn.
- Plumbago.**  
Chicago Fdy. Supply Co., Chicago, Ill.
- Polishing Machines.**  
Watson & Stillman, 204 E. 43d, N. Y.
- Polishing Wheel.**  
La Massena, C. E. & Co., Newark, N. J.
- Post Hole Diggers.**  
Gibbs Mfg. Co., Canton, Ohio.  
Graham, John H. & Co., 113 Chambers  
St., New York.  
Wister, L. R. & Co., Philadelphia, Pa.
- Poultry Nettings.**  
Barnum, E. T., Detroit, Mich.  
Gilbert & Bennett Mfg. Co., 42 Cliff  
St., N. Y.  
N. J. Wire Cloth Co., Trenton, N. J.  
"Silver Finish."  
Wright & Colton Wire Cloth Co.,  
Worcester, Mass.
- Powder.**  
Lafayette and Rand Powder Co., 29 Murray  
New York Powder Co., 62 Liberty St.,  
N.
- Power Hammers.**  
Bradley & Co., Syracuse, N. Y.  
Selden Mch. Co., New Haven, Conn.  
Dienelt & Eisenhardt, Philadelphia.  
Dupont Mfg. Co., St. Johnsbury, Vt.  
Hackney Hammer Co., Cleveland, O.  
Long & Allstatter Co., Hamilton, Ohio  
Jenkins & Lingie, Bellefonte, Pa.
- Power Punches and Shears.**  
Eaton, Geo. H. & Co., Boston, Mass.  
Long & Allstatter Co., Hamilton, Ohio
- Presses, Dies, &c.**  
E. W. Bliss Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Niagara Stamping and Tool Co., Buf-  
falo, N. Y.  
Stiles & Parker Press Co., Brooklyn,  
N. Y.
- Presses, Power, Makers of.**  
Bliss, E. W. Co., Brooklyn, N. Y.  
Eaton, Geo. H. & Co., Boston, Mass.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Merriman, A. H., West Meriden.  
Niagara Stamping and Tool Co., Buf-  
falo, N. Y.  
Stark Mch. & Tool Co., Buffalo, N. Y.  
Waterbury Farrel Foundry and Ma-  
chine Co., Waterbury, Conn.
- Pulleys.**  
Lake, J. H. & D. Co., Hornellsville, N. Y.
- Pulverizing Mill.**  
Bradley Fertilizer Co., Boston, Mass.
- Pump Governors.**  
Johnson T. M. New London, Conn.
- Pumping Machinery.**  
Dean Bros. Steam Pump Works, In-  
dianapolis, Ind.  
Hooker-Clivie Steam Pump Co.,  
Chicago, Ill.  
McCowan, J. H. & Co., Cincinnati, O.  
Maslin, J. & Son, Jersey City, N. J.  
Norwalk Iron Wks. Co., So. Norwalk,  
Conn.  
Schwartz Fdy. & Mch. Co., Phila., Pa.  
Valley Pump Works, Easthampton,  
Mass.
- Pumps, Makers of.**  
Bellevue Pump Co., Bellevue, Iowa.  
Deming Co., Salem, O.  
Douglas, W. & B., Middletown, Conn.  
Mast, Foss & Co., Springfield, O.  
Myers, F. E. & Bro., Ashland, O.  
St. Joseph Pump Co., St. Joseph, Mo.
- Punches and Shears, Hand and  
Power.**  
New Dorf Mfg. Co., Janesville, Wis.  
Niagara Stamping and Tool Co., Buf-  
falo, N. Y.  
Stark Mch. & Tool Co., Buffalo, N. Y.
- Punching and Shearing Presses.**  
E. W. Bliss Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Stiles & Parker Press Co., Brooklyn,  
N. Y.
- Wais & Roos, Punch & Shear Co., Cin-  
cinnati, Ohio.**
- Waterbury Farrel Foundry and Mch.  
Co., Waterbury, Conn.**
- Watson & Stillman, 204 E. 43d, N. Y.**
- Rails, Old and New.**  
Hirsh, L. K., Chicago, Ill.  
Perry, W. H. & Co., Providence, R. I.  
Richards, J. B. & Co., Pittsburgh, Pa.
- Railway Supplies.**  
Scully-Castle Co., Chicago, Ill.
- Rat and Mouse Traps.**  
Burditt & Williams, Boston, Mass.  
Estey, W. S., 65 Fulton, N. Y.  
Ripley Mfg. Co., Unionville, Conn.
- Razors.**  
Butcher, W. & S., 135 Duane St., N. Y.  
Curley, J. & Bro., 6 Warren St., N. Y.  
Electric Cutlery Co., 113 Chambers, N. Y.  
Schmitz, E. Lothar, 92 Reade St., N. Y.  
Southington Cutlery Co., Southington,  
Conn.  
J. R. Torrey Razor Co., Worcester,  
Mass.
- Recording Pressure Gauges.**  
Bristols Mfg. Co., Waterbury, Conn.
- Refrigerator Door Fasteners.**  
Conroy, P. J. & Co., Philadelphia.
- Refrigerators.**  
Grand Rapids Refrigerator Co., Grand  
Rapids, Mich.
- Rivers.**  
Blake & Johnson, Waterbury, Conn.  
Cobb & Drew, Plymouth, Mass.  
Henderson, Jas. S., 165 Greenwich, N. Y.  
Plymouth Mills, Plymouth, Mass.  
Sternbergh, J. H. & Son, Reading, Pa.  
Thompson, Judson L. Mfg. Co., Bos-  
ton, Mass.  
Townsend, W. P. & Co., New Brighton
- Riveting Machines.**  
Adt. Jno. & Sons, New Haven, Conn.
- Roasters and Bakers.**  
Matthai, Ingram & Co., Baltimore, Md.
- Rock Drills.**  
Fenns, Diamond Drill & Mfg. Co.,  
Birdsboro, Pa.  
Rand Drill Co., 23 Park Place, N. Y.
- Rolling Mill Machinery.**  
Birmingham Iron Fdry, Birmingham,  
Conn.  
Booth, The Lloyd Co., Youngstown, O.  
Leachburg Foundry & Mch. Co., Pitts-  
burgh, Pa.  
Mahoning Fdry & Mch. Co., Danville, Pa.  
Morgan Construction Co., Worcester,  
Mass.
- Robinson-Rea Mfg. Co., Pittsburgh.**  
Totten & Hogg Iron and Steel Fdry Co.,  
Pittsburgh, Pa.
- Waterbury Farrel Foundry & Mch.  
Co., Waterbury, Conn.**
- Roll Lathes.**  
Totten & Hogg Iron & Steel Fdry Co.,  
Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**  
Booth, The Lloyd Co., Youngstown, O.  
Chicago Foundry Co., Chicago, Ill.  
Garrison, A. & Co., Pittsburgh, Pa.  
Johnson Foundry Co., Johnstown, Pa.  
Seaman, Sleigh & Black, Pittsburgh.  
Totten & Hogg Iron and Steel Fdry Co.,  
Pittsburgh, Pa.
- Roofing.**  
Berlin Iron Bridge Co., E. Berlin, Conn.  
Boston Bridge Works, Boston, Mass.  
Cambridge Roofing Co., Cambridge, O.  
Johns, H. W. Mfg. Co., 87 Maiden Lane
- Roofing Slate.**  
Auld & Conger, Cleveland, O.
- Rope.**  
Travers Bros. Co., 107 Duane St., N. Y.
- Rope and Web Goods.**  
Cotton Mfg. Co., West Tr. Y., N. Y.  
Coverts Saddlery Wks., Farmer, N. Y.
- Rubber Goods.**  
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**  
Larkin Rule Co., Saginaw, Mich.  
Stanley Rule & Level Co., 29 Chambers,  
N. Y.
- Sad Irons.**  
Universal Sad Iron Co., Milwaukee, Wis.
- Sand Paper.**  
Baeder, Adamson & Co., Phila., Pa.
- Sap Spouts.**  
Post, C. C., Burlington, Vt.
- Saws, Manufacturers of.**  
Caldwell Mfg. Co., Rochester, N. Y.  
Coleman Hdw. Co., Chicago, Ill.  
Huginin, R. B., W. F. Mfg. Co. Hart-  
ford, Conn.  
Fullman Sash Balance Co., Rochester,  
N. Y.
- Stewart & Baker, Rochester, N. Y.**
- Sash Cords and Chains.**  
Morton, Thos., 65 Elizabeth, N. Y.  
Ossawan Mills Co., Norwich, Conn.  
Samson Cordage Works, Boston, Mass.  
Smith & Edge, Mfg. Co., Bridgeport,  
Conn.
- Sash Locks.**  
Champion Safety Lock Co., Cleveland,  
Ohio.  
Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**  
Empire Portable Forge Co., Lansing-  
burgh, N. Y.
- Palmer Hardware Mfg. Co., Troy, N. Y.**
- Sash Weights.**  
Brown, E. E. & Co., Philadelphia, Pa.
- Saws, Makers of.**  
Atkins, E. C. & Co., Indianapolis, Ind.  
Bishop, W. & Sons, Phila., Pa.  
Jennings, C. E. & Co., 97 Chambers, N. Y.  
National Saw Co., 96 Reade St., N. Y.  
Richardson Bros., Newark, N. J.  
Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**  
Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**  
Buffalo Scale Co., Buffalo, N. Y.  
Chattillon, John & Sons, 85-89 Cliff, N. Y.
- Screens, Door and Window.**  
Queen Anne Screen Co., Burlington, Vt.
- Screw Cutting Machinery.**  
Wiley & Russell Mfg. Co., Greenfield,  
Mass.
- Screw Drivers.**  
Brown, R. H. & Co., New Haven, Conn.  
Capitol Mfg. Co., Chicago, Ill.  
Chantrell Tool Co., Reading, Pa.  
Mayhew, H. H. Co., Shelburne Falls,  
Mass.
- Screw Plate and Pipe Cutter.**  
Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Wm. H. Haskell Co., Pawtucket, R. I.  
Miles, E. S., 205 Quarry, Philadelphia.  
National Screw & Tack Co., Cleveland,  
Ohio.  
Reynolds & Co., New Haven, Conn.  
Worcester Machine Screw Co., Wor-  
cester, Mass.
- Sewer Saws.**  
Barnes, W. F. & John, Rockford, Ill.
- Seneca Falls Mfg. Co., Seneca Falls, N. Y.**
- Seythe Stones and Whetstones.**  
Pike Mfg. Co., Pike Station, N. H.  
Cleveland Stone Co., Cleveland, O.  
Huron Grindstone Co., Port Austin.
- Separators, Steam.**  
Stratton Separator Co., 32 Cortlandt  
St., N. Y.
- Shafting, Makers of.**  
Cresson, Geo. V., Co., Philadelphia, Pa.  
Fairmount Mch. Co., Philadelphia, Pa.  
Fitzsimons & Co., Cleveland, Ohio.  
Sellers, Wm. & Co., Inc. Phila., Pa.  
Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manu-  
facturers of.**  
Atma Iron & Steel Co., Bridgeport, O.  
Allentown Rolling Mill, Phila.  
Carnegie, Steel Co. Ltd, Pittsburgh, Pa.  
Illinois Steel Co., Chicago, Ill.  
Lockhart Iron & Steel Co., Pittsburg,  
Pa.  
Passaic Rolling Mill Co., Paterson, N. J.  
Pottsville Iron & Steel Co., Pottsville,  
Pa.  
Roberts, A. P. & Co., Phila., Pa.  
The Phoenix Iron Co., Phila., Pa.  
Tudor Iron Works, St. Louis, Mo.
- Shed and Scales.**  
Acme Scales Co., Bridgeport, Conn.  
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manu-  
facturers of.**  
Atma Iron and Steel Co., Bridgeport,  
Cambridge Iron & Steel Co., Cambridge,  
O.  
Carroll-Porter Boiler & Tank Co.,  
Pittsburgh, Pa.  
Chess Bros., Pittsburgh, Pa.  
Moorhead-McCleane Co., Pittsburgh,  
Pierson & Co., 24-29 West St., N. Y.  
Reeves Iron Co., Canal Dover, O.  
Relly, John W., Fort Hunter, P. O., Pa.  
Singer, Nickle & Co., Ltd., Pittsburgh,  
Pa.  
The Mahoning Valley Iron Co., Youngs-  
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BRITISH AGENCY: Office of The Ironmonger, 42 Cannon St., London.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received. Newsdealers or Booksellers in any part of the world may obtain The Iron Age through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

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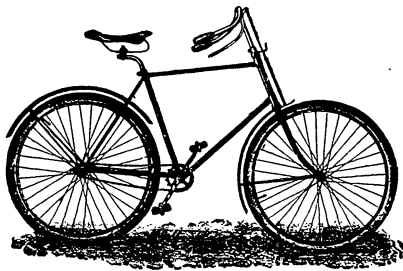
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Co.	82	Co.	32	Graham Twist Drill &	51	McClure & Amster.	30	Pike Mfg. Co.	55	Stocking, E. B.	6
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American Engine Co.	111	Chrome Steel Works.	21	Grand Rapids Refrigerator	86	McFarland, Wm.	2	Pittsburgh Iron & Steel	30	Stover Mfg. Co.	93
American Metal Co.	4	Church & Sleight.	45	Grant Anti-Friction Ball	46	McGowan, J. H. & Co.	38	Pittsburgh Mfg. Co.	43	Stow Flexible Shaft Co.	51
American Pig Iron & Storage	20	Claflin Mfg. Co.	40	Grant Corundum Wheel	56	McIlvaine, Wm. & Sons.	29	Pittsburgh Reduction Co.	68	Stratton Separator Co.	51
American Saw Co.	96	Clapp, Geo. M.	61	Mfg. Co.	56	McKay, Jas. & Co.	18	Place, Geo.	60	Stuart & Peterson Co.	85
American Screw Co.	14	Clark, G. P.	104	G. Co.	56	MacKellar Fdry Facing &	32	Plenty Horticultural &	10	Sturtevant, B. F. Co.	45
American Spiral Spring	3	Cleveland Block Co.	96	Grant Corundum Wheel	56	Supply Co.	32	Skylight Works.	12	Stutzman, J. M.	20
American Stamping Co.	93	Cleveland City Forge &	96	Gurney, F. B.	111	McKinney Mfg. Co.	90	Plumb, Fayette.	9	Supplies Hardware Co.	102
American Tool Co.	78	Iron Co.	89	Hackney Hammer Co.	111	McLean, John.	33	Plymouth Mills.	9	Surplus, Dunn & Alder.	82
American Tool Works.	58	Tool Co.	89	Haight & Clark.	27	McNab & Harlin Mfg. Co.	35	Pollock, W. B. & Co.	37	Sweetser, W. A.	98
American Well Works.	39	Cleveland Stone Co.	55	Haley Mfg. Co.	6	Machinists' Supply Co.	60	Poole, Robt. & Son Co.	37	Swindell, W. & Bros.	31
American Wire Co.	13	Cleveland Twist Drill Co.	51	Halk & Naumann.	97	Mahoning Fdry & Mch. Co.	39	Pope Mfg. Co.	69	Syracuse Steel Foundry	25
Ames Sword Co.	48	Cleveland & Hardwick.	37	Halsey, J. A.	97	Mahoning Valley Iron Co.	27	Port Chester Bolt & Nut	10	Taintor Mfg. Co.	77
Angus, C. H.	28	Coburn Trolley Track Co.	92	Hart, Henry C. Mfg. Co.	49	Main Belting Co.	37	Fortmouth Wrench Co.	99	Tablet & Ticket Co.	67
Ansonia Brass & Copper	2	Coe, Loring & Co.	98	Hart, Henry C. Mfg. Co.	49	Mane, Edwin B. & Co.	18	Post, C. C.	99	Talcott, R. G. Co.	40
Co.	2	Coe, Wrench Co.	98	Hart, Henry C. Mfg. Co.	49	Manning, Maxwell &	51	Pottstown Iron Co.	21	Taylor & Boggis Foundry	27
Aracade Malleable Iron Co.	23	Coffin & Leighton.	46	Hart, Henry C. Mfg. Co.	49	Manville Machine Co. E. Jr.	57	Pottville Iron & Steel Co.	17	Thomson Electric Welding	24
Armstrong Mfg. Co.	28	Colburn, A. L.	88	Hart, Henry C. Mfg. Co.	49	Manfield, H. H.	61	Powell Planer Co.	42	Thomson-Houston Motor	52
Aschman Steel Casting	26	Colby, Wm. C.	103	Hart, Henry C. Mfg. Co.	49	Maris & Beekley.	58	Pratt & Letchworth.	52	Thomson, Judson L. Mfg.	104
Co.	26	Coleman Hdw. Co.	88	Hart, Henry C. Mfg. Co.	49	Maslin, J. & Son.	58	Pratt & Letchworth.	52	Tiebout, W. J.	92
Atashly, J. A.	6	Collins, W. S.	33	Hart, Henry C. Mfg. Co.	49	Mathiasen & Hegeler	2	Pratt & Letchworth.	52	Titchener, E. H. & Co.	8
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Baader, Adamson & Co.	100	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Trenton Iron Co.	4
Baldley, J. B. & Co.	70	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Trenton Malleable Iron	28
Baldley, J. B. & Co.	70	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Trimble, W. & Co.	97
Barnes, C. K. & Co.	92	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Troy Nickel Works.	79
Barnes, W. F. & John.	48	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Tuck Mfg. Co.	7
Barnett, G. & H.	77	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Tucker & Dorsey.	89
Barnum, E. T.	8	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Tudor Iron Works.	1
Becker, Jno. Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Tyler Wire Works Co., W.	68
Beiden Mch. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Union Mill, Clifton & Co.	84
Bellvue Pump Co.	72	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Union Mfg. Co.	49
Bement, Miles & Co.	45	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Union Metallic Cartridge	1
Bemis & Call Hdw. & Tool	97	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Co.	1
Co.	97	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Unity Door Check Co.	92
Berger Bros.	16	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Universal Radial Drill Co.	60
Berlin Iron Bridge Co.	18	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Universal Sadr Iron Co.	93
Berryman, Jas.	84	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Valley Forge & Co.	28
Bethlehem Iron Co.	22	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Valley Pump Works Co.	58
Bevin Bros. Mfg. Co.	84	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Van Dorn Iron Works Co.	8
Bicycle Step Ladder Co.	81	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Van Wagoner & Williams	112
Bigelow, C. R.	63	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Co.	112
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Victor Mfg. Co.	92
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Wais & Roos Punch and	46
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Waldo & Stout.	3
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Wallace, Wm. H. & Co.	22
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Waltham Emery Wheel	66
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	wardlow, S. & O.	19
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Warner Lock Co.	78
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Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Co.	49
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Washington Shops.	4
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Waterbury Brass Co.	2
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Waterbury Farrel Foundry	47
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
Bigman & Keeler Mfg. Co.	43	Henderson Mch. Tool Co.	43	Hart, Henry C. Mfg. Co.	49	Merriman, A. H.	44	Pratt & Letchworth.	52	Watson & Stillman.	45
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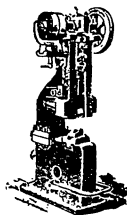
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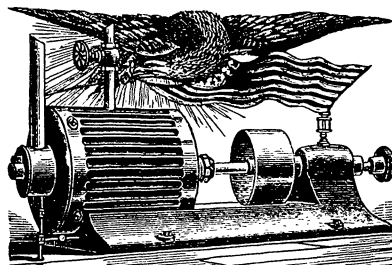
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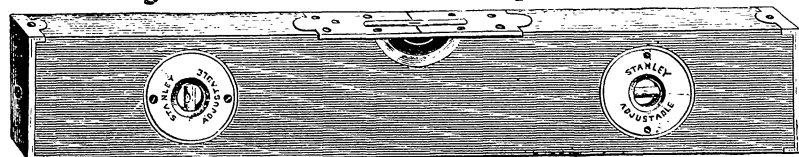
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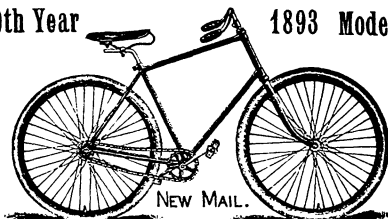
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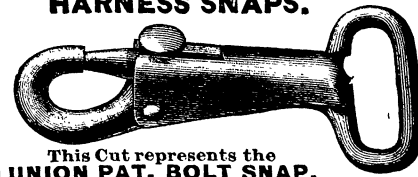
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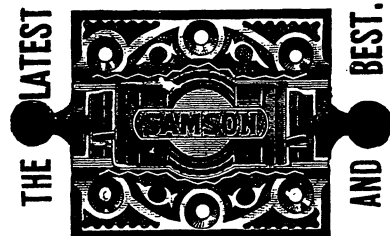
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# THE IRON AGE

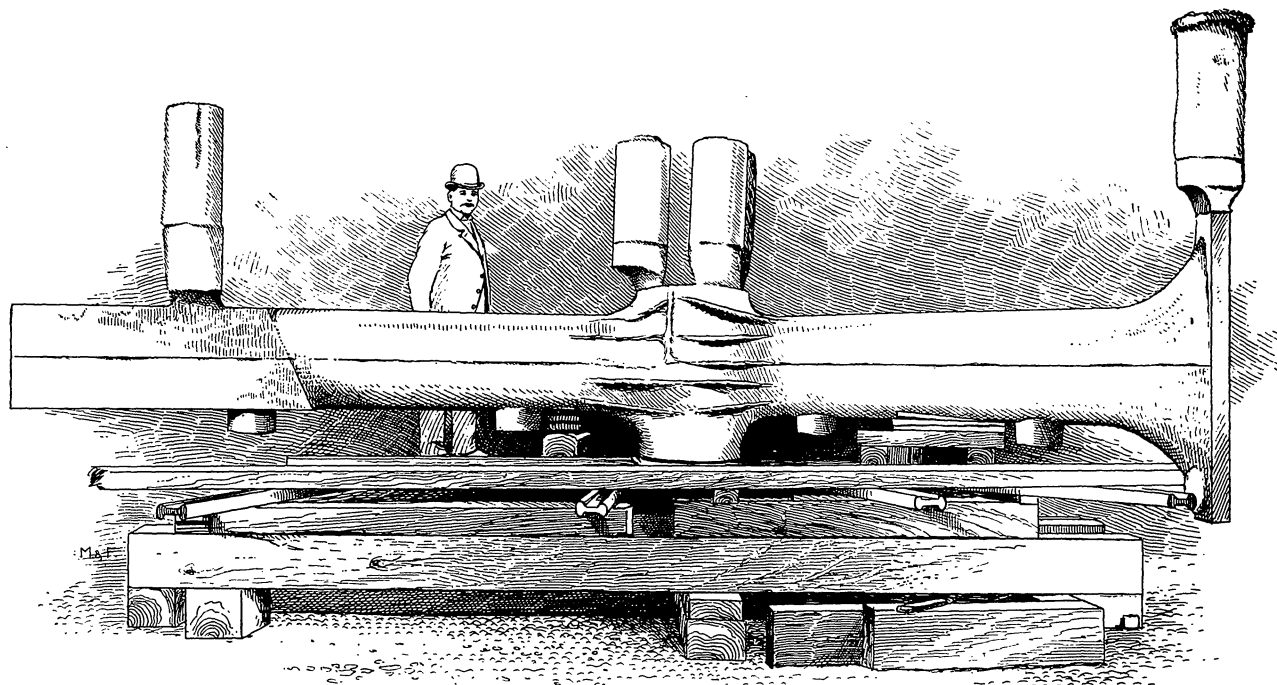
THURSDAY, JANUARY 16, 1893.

## Rudder of the Battle Ship "Oregon."

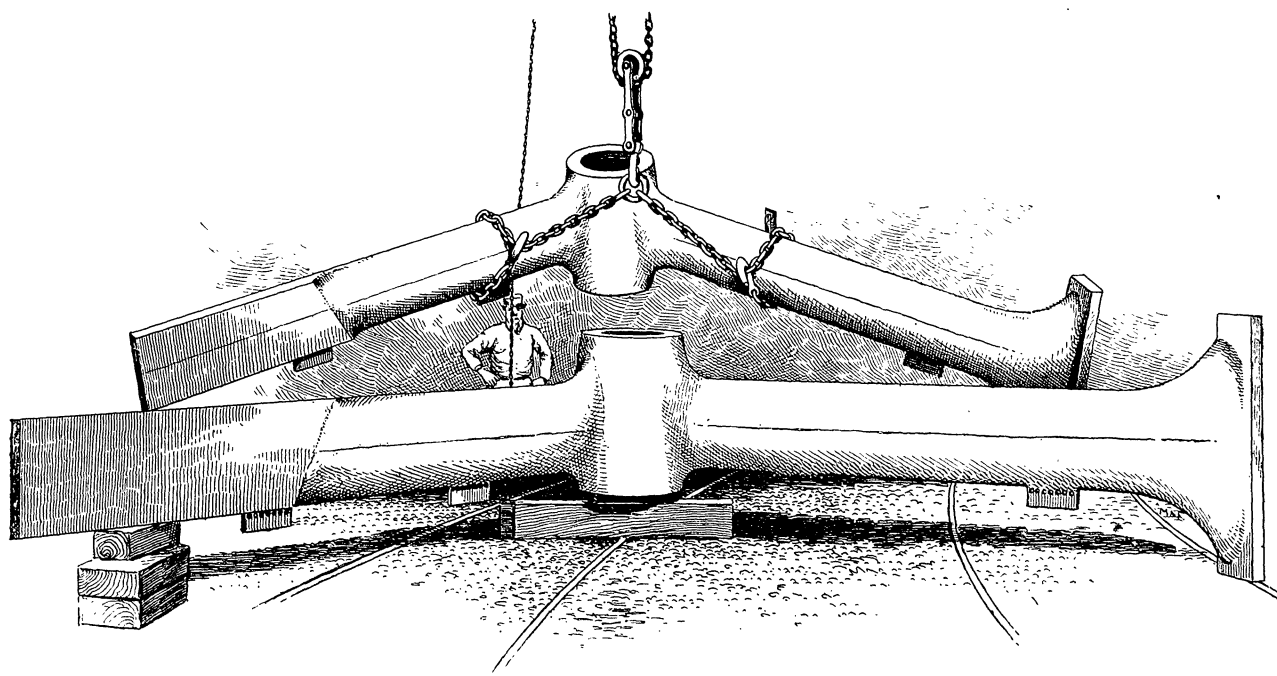
Through the courtesy of Patrick Noble, superintendent of the Pacific Rolling Mill Company of San Francisco, Cal., we are enabled to present engravings of the cast-

engrading is one of great interest, as it clearly shows the method of casting with risers. The second view shows the struts ready for shipment, the risers or heads having been removed. The weight of the two struts without the risers is 27,400 pounds.

connected to the rudder frame by tap rivets. The rudder is actuated by hydraulic steering gear, with a working pressure of 1000 pounds per square inch, working through a cross head on the rudder post. Hydraulic gear was adopted for the following reasons: 1. The rudder is always



CAST-STEEL STRUTS FOR THE BATTLE SHIP "OREGON."—SHOWING THE RISERS.



CAST-STEEL STRUTS FOR THE BATTLE SHIP "OREGON."—RISERS CUT OFF.—PACIFIC ROLLING MILL COMPANY, BUILDERS.

steel struts and of the forged-iron frame of the rudder of the battle ship "Oregon,"\* now being built by them. The first

\*In *The Iron Age* of May 7, 1891, we described and very thoroughly illustrated the battle ships "Oregon," "Indiana" and "Massachusetts," two of which are being built by the Cramps and the other by the Pacific Rolling Mill Company.

The rudder of this vessel—a drawing of which is here presented—is formed of two parts—viz., a frame of solid forged iron, with solid head 16 inches in diameter, to which the steering gear is attached, and side plates of rolled steel  $\frac{3}{4}$ -inch thick, the space between the plates being filled in solid with pine. The side plates are con-

firmedly held in position by the water on each side of the pistons, the water shock on rudder being taken by relief valves on the hydraulic cylinders. 2. The great compactness of the gear and the fact that hydraulic gear is employed to work the guns of the vessel. The gear consists of two double-acting cylinders 14 inches





your committee understands, after conference with the chairman of the Executive Committee on Awards, is intended to be the effect of the same when put in practical operation, and do not, moreover, so interfere with the general scheme of said committee as to deprive it of the characterization as an "American system."

It shall be the duty of each individual judge to make a report in writing over his own signature of the result of the examination of each exhibit primarily examined by him as each examination shall have been completed; and as to every exhibit so examined which he shall deem worthy of an award he shall formulate in words the specific points of excellence or advancement disclosed thereby, and which in his opinion renders it worthy of an award. Every report shall be submitted as soon as possible to the committee of which such judge is a member for a finding in the premises; and in every case where, by the vote of the majority of such committee, it is determined that an exhibit is worthy of receiving an award, said committee shall forthwith formulate in written words the specific points of excellence or advancement which, in his opinion, warrant the award, and transmit the same, certified by its president or vice-president and secretary, to the Executive Committee of Awards. And in case the finding of the committee shall differ from the conclusion of the individual judge making the primary examination, either as to its being worthy of an award or as to the character of the points of excellence or advancement it possesses, it shall be so distinctly stated in the report of said committee.

In every case where the finding of the departmental committee coincides with the conclusion of the individual judge, the said committee shall transmit, with such finding, the report of such individual judge to the Executive Committee on Awards; and in those cases where the finding of the departmental committee does not coincide with the conclusion of the individual judge, then the finding in each such case shall be accompanied by the written report of one of its members who shall have examination of the exhibit, formulating therein in words the specific points of excellence or advancement possessed by such exhibit.

In every case where the finding of the committee is not in accord with the conclusion of the individual judge it shall be within the power of the Executive Committee on Awards, if in its judgment justice demands it, to refer the report back to the committee of that department whence it emanated, with the direction to review and further consider the case and report its finding under such review, without delay, to said Executive Committee on Awards, and such finding shall be conclusive.

#### The World's Fair Yachts.

The fleet of water craft to navigate the lagoons and basins at the fair is now calling for the labors of 200 or 300 shipwrights. The 50 electric launches for the lagoons are being constructed at Detroit and Racine. The larger boats for the basins and naval exhibits, commodious steam yachts in size, machinery and appointments, occupy the stocks in the shipyard of Charles P. Willard & Co. of Chicago, on the North Branch of the Chicago River. There are 12 of these steam yachts, exactly alike above the water line. Alongside of them are five larger boats, all designed for World's Fair traffic next season. If there is time a half-dozen more will be constructed before the opening of the fair. The later additions will be smaller and have less engine power.

When Mr. Willard secured the concession of running boats on the basins he was confronted with the question of what he was going to do with a dozen boats after the fair was over. At best they would be second hand, and must be disposed of at some price. It could not be hoped that the profits of the World's Fair season, after handing over 25 per cent. of the gross receipts to the Exposition Company, would be large enough to offset a big depreciation.

Acting on this idea, the boats were designed to be large and stanch. The exposition fixed the limit of length at 50 feet, and Mr. Willard took the limit.

Outside of the machinery the dozen boats for the basins and the five larger yachts are now nearly completed. The 17 standing side by side on the stocks make a pretty sight, even on a cold day with the wind and snow blowing through the

chinks in the huge shed. On some the permanent cherry and mahogany awning is being fitted. On a pleasant day next April the procession will steam out of the North Branch and down Chicago River to the lake. No finer fleet of steam yachts ever specked Lake Michigan than will be these boats as they hug the shore on their way to Jackson Park.

When the first boat was completed, with the exception of machinery, Mr. Willard made a temporary launch. The boat was towed to a stone derrick by the river side, and exactly 29,500 pounds of stone was lowered into the boat. Just 2 feet of its white side was out of water. Although the displacement had been carefully figured, still there might have been an error, and the shipbuilder was taking no chances. Counting the machinery, fuel and permanent fittings to weigh 5 tons, the boat would have a carrying capacity of 10 tons. This left a wide margin for the local steamboat inspectors, who passed on the plans and fixed the Government limit at 75 passengers.

All 17 boats will have triple expansion engines exactly alike. The cylinders will be 4½, 7 and 12 inches in diameter with 8-inch stroke. The boilers will be the Roberts safety water-tube style, to stand the Government test of 200 pounds pressure to the square inch. Running wide open the machinery will develop 100 horse-power. With the ordinary cut-off of steam they will show an economical working force of 83 horse-power. This is in excess of the requirements at the fair, as high speed will not count for much in the short runs, but after the fair is over a good 12-mile boat will be much more salable than one of less speed. The machinery alone will cost over \$3000 for each boat.

The World's Fair yachts are built with rather bluff, straight bows, and are intended to sit squarely in the water. The boilers and engines are amidships, and are low down in order to lower the center of gravity. A cabin, the roof of which is 3 feet above decks, will cover them. The steering wheel will be in the open space at the bow. Awnings, supported by permanent frames, will extend the entire length. The engines have bronze connecting rods and will be highly ornamented. They will run without noise, and, as the furnaces will use hard coal, the boats will be pleasant for sightseeing. The planking is of oak and white cypress, 1 and 1½ inches thick. The frames are of oak. Brass openings with automatic valves take the place of the usual "scuppers" by which water runs from the deck on a heavy sea.

The five larger steam yachts are trim in model. They are 66 feet keel, 74 feet long over all and 10½ feet wide. They will have a cutter bow, with bowsprit, and two spars, fore and aft. Being extremely sharp, they will have greater speed on the same power than the shorter boats. The boiler and engine will be housed in, but otherwise the decks will be free. Awnings, held by the spars, will be their covering. The rail is handsomely paneled in quarter-sawed oak. These yachts will cost about \$7000 apiece. They will be for charter during next summer to private parties who prefer that way of going to Jackson Park.

Already clubs are being formed among residents of the North Side to charter or buy steam yachts for next season. The example of the Buena Park Club in having its own steam yacht has called general attention to the pleasures of yachting on the club plan, and Mr. Willard has prepared for quite a craze in that direction by having speedy and commodious boats which can be chartered by those who do not care to buy. The five will be ready for service at the same time the dozen will sail for the fair grounds.

Following the custom of some steamer lines, the steam yachts will be named after countries the names of which begin and end with "A." The first one, of course, will be the "America."

#### Time for the Big Building.

There will be many grand objects to gaze upon in the Manufactures Building when the exposition opens, but there is to be one especially which will not fail to attract the attention of all who enter the place. That will be the imposing clock tower which is to stand in the center of the building. It will be 120 feet in height and 40 feet across at the base. The base will be formed of four round towers rising to a height of 40 feet. The spaces between the tops of the towers will form archways 30 feet high, which, like the whole structure, will be the same on all four sides. Each tower will be hollow and 10 feet in diameter. One of them will be used as a stairway to the upper part of the main structure and the others will be rented out as concessions.

The archways between the four lower towers will terminate in a groined dome. Over this dome will be the first floor of the clock tower. It will be surrounded by an ornamental balcony, having for its principal ornamentation at intervals the shields of the different States of North America and the coats-of-arms of the South American States. At each corner of the balcony and immediately over the base towers will be domes supported by eight small columns.

The width across the big tower at this point, which might be termed the second story, will be reduced to 24 feet. Within this space will be the resting room for the select few who shall be admitted to this favored spot, for it is believed that if the general public was allowed to enter there would be considerable overcrowding.

Over this room will be another, in which is to be placed the mechanism of the big clock, whose dials will show forth the time of day at a distance of 70 feet from the floor of the building. There will also be in this room a keyboard, by means of which chimes can be played on nine bells situated high up in the tower.

The fourth story will be the location of the hands of the clock, the dials of which will be 7 feet in diameter. According to the design there is an allowance of 1 foot diameter for the dials for each 10 feet from the ground.

The fifth story will change from the square build of the rest of the tower underneath to a round shape. It will be open and have four double sets of arches. In here will be placed the nine bells. The upper arches will support a dome about 20 feet in diameter, and the whole will be surmounted with a large globe, at a height of 120 feet, showing the old and new continents in bold relief. The great body of the entire tower will be in white and gold, and all the ornamentation is to be richly gilt.

The base of the structure will be open between the towers, thus allowing free travel to the sightseers. Near the lower part of each tower will be illustrations showing a history of the discovery of America, and the keystone of the arches will be formed of the shields of Ferdinand and Isabella of Spain.

The balconies on each of the four sides will be arranged as music stands, from which the various bands will at times be heard.

The clock will be self-winding. In place of having a man go up into the tower every now and then to wind it an electric motor will perform the work automatically. At stated intervals the working of the clock will establish an electric circuit and set the winder in motion.

The clock is loaned without cost by the Self-Winding Clock Company of New York

City. The chime of bells is put in by the Clinton H. Meneely Company of Troy, N. Y.

#### Assignments of Space.

Director-General Davis has submitted to the Executive Committee a report on the amount of space allotted to foreign and domestic exhibitors. Practically all the room in the 13 exhibits buildings has been assigned. Space for the live stock display has not been allotted because it is too early as yet to determine how a proper apportionment should be made.

Out of the 3,642,966 square feet of exhibit space foreign governments have received 1,420,027 feet and domestic exhibitors 1,787,263 feet. This is apparently favorable to domestic exhibitors. At the Centennial Exposition there were approximately 24,000 foreign exhibitors and 10,000 domestic ones. According to the allotment made by Colonel Davis, the domestic exhibitors are given the most favorable opportunity practicable for securing space.

While 90 per cent. of the available space has been apportioned, the final notices to exhibitors have not all been sent out.

The following table indicates the total area in square feet in each one of the exhibit buildings and the amount of space assigned in the same to foreign and domestic exhibitors:

Department.	Total area.	Foreign exhibitors.	Domestic exhibitors.
Agriculture.....	415,348	134,732	251,471
Horticulture.....	158,593	40,516	69,612
Live stock (no assignments until later).			
Fisheries.....	80,598	21,875	42,132
Mines and mining.....	272,615	86,380	142,918
Machinery.....	456,661	129,302	204,771
Transportation.....	590,589	166,654	402,938
Manufactures.....	790,942	423,670	215,927
Electricity.....	185,100	60,932	137,072
Fine arts.....	122,436	161,992	30,444
Liberal arts.....	346,206	119,754	202,420
Ethnology.....	101,312	43,656	57,656
Forestry.....	52,566	22,664	29,902
Totals.....	3,642,966	1,420,027	1,787,263

Out of the entire amount of available space 211,465 square feet has been reserved for concessions. This room will be occupied chiefly by restaurants, booths for the sale of catalogues, mineral waters, guides, &c.

Much disappointment will doubtless be experienced over the space assignment. Many firms who had reason to think that they would secure a fine allotment for the display of their wares will find that they have been omitted altogether. At least 9000 concerns who expected to get into the Manufactures Building have been shut out. This may give rise to the charge of unjust discrimination and partiality, but the exposition officials claim that they found themselves obliged to discriminate and that they have accepted only such exhibits as appear to them to be of the highest character and calculated to reflect credit on an international display.

#### World's Fair Appropriations.

Appropriations for the fair by foreign governments and the different States of this country are practically closed up and President Harrison will shortly be officially informed by President Palmer's report just how much the United States and all countries are going to do for the big fair. Foreign governments have, all told, set apart approximately \$5,843,598.

This amount is distributed among 86 nations, colonies, principalities, &c. Of this number 38 have organized official commissions to conduct their World's Fair business. The remaining number will have exhibits at the fair under less pretentious aspics. There are already in progress of construction 16 foreign government buildings. These pavilions are special in their nature. Countries which

will make exhibits in the main buildings have not deemed it necessary to construct special pavilions.

Here is the list of foreign countries which have made appropriations and the amounts of the same:

Argentina.....	\$100,000	Guatemala.....	\$200,000
Austria.....	102,300	Hawaii.....	40,000
Belgium.....	57,000	Honduras.....	20,400
Bolivia.....	30,000	Hayti.....	25,000
Brazil.....	600,000	India.....	30,000
British Guiana.....	25,000	Japan.....	630,000
British Honduras.....	7,500	Jamaica.....	24,333
Barbadoes.....	5,840	Leeward Islands.....	6,000
Colombia.....	100,000	Liberia.....	7,000
Costa Rica.....	150,000	Mexico.....	50,000
Canada.....	100,000	Morocco.....	150,000
Cape Colony.....	50,000	Netherlands.....	100,000
Ceylon.....	65,600	Nicaragua.....	31,000
Cuba.....	25,000	Norway.....	56,280
Denmark.....	67,000	New South Wales.....	243,325
Danish West Indies.....	1,200	Orange Free.....	7,500
Dutch West Indies.....	5,000	Paraguay.....	100,000
Ecuador.....	125,000	Peru.....	140,000
France.....	733,400	Russia.....	46,328
Germany.....	800,000	Salvador.....	12,500
Great Britain.....	291,000	San Domingo.....	25,000
Greece.....	60,000	Spain.....	214,000
		Sweden.....	108,000
		Trinidad.....	15,000

Following the recital of what moneys have been appropriated by foreign countries comes a list of the States which have set aside money for the fair. Thirty-one of the States are erecting pavilions. Their appropriations run as follows and aggregate \$3,100,045:

Arizona.....	\$30,000	Nebraska.....	\$50,000
California.....	300,000	New Hampshire.....	25,000
Colorado.....	100,000	New Jersey.....	20,000
Delaware.....	10,000	New Mexico.....	25,000
Idaho.....	20,000	New York.....	300,000
Illinois.....	500,000	North Carolina.....	25,000
Indiana.....	75,000	North Dakota.....	25,000
Iowa.....	125,000	Ohio.....	100,000
Kentucky.....	100,000	Pennsylvania.....	300,000
Maine.....	40,000	Rhode Island.....	25,000
Massachusetts.....	75,000	Vermont.....	15,000
Michigan.....	100,000	Washington.....	100,000
Minnesota.....	50,000	West Virginia.....	40,000
Missouri.....	50,000	Wisconsin.....	65,000
Montana.....	50,000	Wyoming.....	30,000

A number of States expect to secure increased appropriations. New York is asking for \$300,000 more from its State Legislature and Governor Flower has recommended it. New Jersey is pleading for \$70,000. North Dakota also wants more money.

#### Miscellaneous.

An interesting feature of the Government exhibit will be a model of the earth, with all the geometrical accuracy that mechanism and art can give to such a difficult representation. It is intended to form a part of the exhibit from the General Land Office of the Interior Department. So far as known it is the largest globe ever constructed. It will surmount a star-shaped edifice, which pedestal will elevate the monster globe 15 feet above the floor, so that it will rise above the surrounding exhibits. The globe will be 63 feet in circumference. A stairway in the pedestal will give access to a gallery at the base of the globe, which will revolve on a horizontal axis.

George Westinghouse, Jr., who has the contract for furnishing the incandescent electric lighting plant for the fair, does not appear to be disturbed by the injunction secured by the Edison Company against his concern. Mr. Westinghouse has just issued a circular announcing that the new stopper incandescent lamps now being manufactured by him will be exclusively used. "At least 92,000 of these lamps," he adds, "will be required by the time the exhibition opens, and it is anticipated that the requirements of exhibitors will increase the number to 130,000 or more."

Germany's list of exhibitors at the exposition numbers 5077 names. In it are represented 230 cities and towns, and of these 40 cities send more than 10 exhibitors each. Berlin leads with 283 exhibitors, Munich is next with 187, Leipzig follows with 149, Frankfurt is next with 57, Hamburg has 55 and Chemnitz has 41. According to this statement it appears that the cholera-infected city will have a big bundle of

goods to display at the fair, but the Director General thinks there will be no danger of infection.

George Chessworth of the London & North-Western Railway of England arrived in Chicago last Wednesday, and called on Chief Willard A. Smith for the purpose of arranging for the installation of the exhibit of that company. The principal feature will be a passenger train headed by a Webb compound locomotive weighing 47 tons, a model ticket office, full-sized models of George Stephenson's "Rocket," Trevithick's locomotive of 1804, and a representation of the L. & N. W. signaling system.

The New York Statue of Liberty, which stands at the entrance of the harbor of the metropolis, is to be shown at the exposition in a model carved out of salt. The exhibit will come from the Salt Union of Cheshire, England. The model will be 12 feet 6 inches high. The ornamental base, which is to be enriched with moldings, panels and inscriptions, stands upon a sub-base of rough, amber colored rock salt. The statue of the goddess herself will measure 5 feet 6 inches high.

There is some friction between the Dominion and Manitoba governments over the Canadian exhibit at the World's Fair. The Manitoba Government has decided not to exhibit in the Canadian section of the World's Fair, but to have a show of its own outside the fair grounds. This action has aroused the ire of the Dominion Government, as it was understood that Manitoba would take part in the Canadian exhibits and give \$2000 toward the erection of a Canadian pavilion.

Electric belt and other appliances of a like character will be given no space in the electricity department of the World's Fair. Chief Barrett and his assistant, Chief Hornsby, have decided to exclude this class of exhibits, as they do not consider these devices as being strictly electrical in their character.

The brick and tile manufacturers of the country and the manufacturers of fire extinguishing machinery have decided practically to put up special buildings adjacent to Machinery Hall for exhibits of these industries.

**Hardened Copper.**—A company has been formed in Chicago under the name of the Excelsior Hardened Copper Company to manufacture a large line of products of hardened copper. The process to be used is the discovery of Peter Johnson, machinist, a native of Sweden, but of late years a resident of Dassel, Minn. Johnson can, he says, harden copper without destroying its ductility. If this can really be accomplished, a great field is open for those who use his process in the manufacture of specialties for electricians. One of the important exhibits made by the men who are introducing Johnson and hardened copper to the world is a small plate  $\frac{1}{4}$  inch thick. With it is shown a steel plate of the same thickness. Both were shot with the same rifle at 120 paces. The bullet in each case was propelled by 60 grains of powder. The steel plate was pierced and shattered; the copper plate stopped the bullet almost at the surface and turned it back flattened. From this and other similar experiments it is inferred that hardened copper, for resistance and malleability, will displace steel in the manufacture of armor plate. An effort will be made to have the metal tested in a comprehensive way at the navy yards of this country. Like experiments will be arranged for abroad.

Plans for four new torpedo boats, each to cost about \$75,000, will probably be approved and the contracts given out before the present administration goes out of office. They will be fitted with quadruple-expansion engines.

The Hugh Kennedy Hot-Blast Stove.\*

BY W. C. COFFIN, PITTSBURGH, PA.

Fire-brick stoves have become a necessary part of the modern coke blast-furnace equipment, and are also superseding

parture from them. All these stoves have approximately the same valve equipment and follow the same line of operation. The waste gas from the furnace enters at one port and burns in a single combustion chamber, and the heated products are drawn through the various passes in the brick work to a stack of

chamber and the first down pass of the Whitwell stoves.

Hugh Kennedy, manager of the Isabella Furnaces, Pittsburgh, Pa., who has had a large experience with the fire-brick hot-blast stoves, was so strongly impressed with the fact that but about 30 per cent. of the brick of the average stove were do-

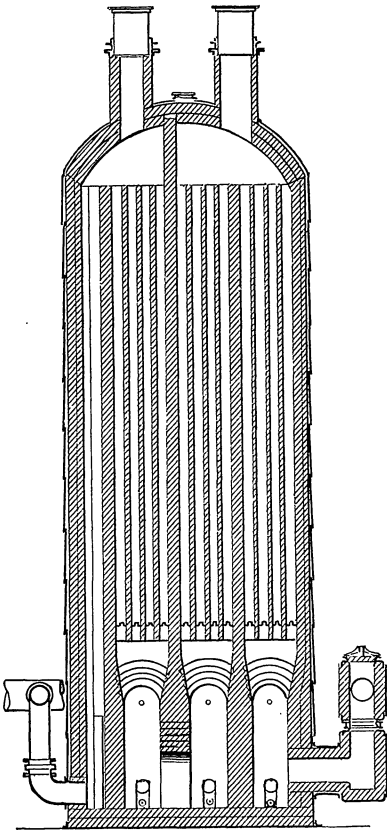


Fig. 1.—Vertical Section.

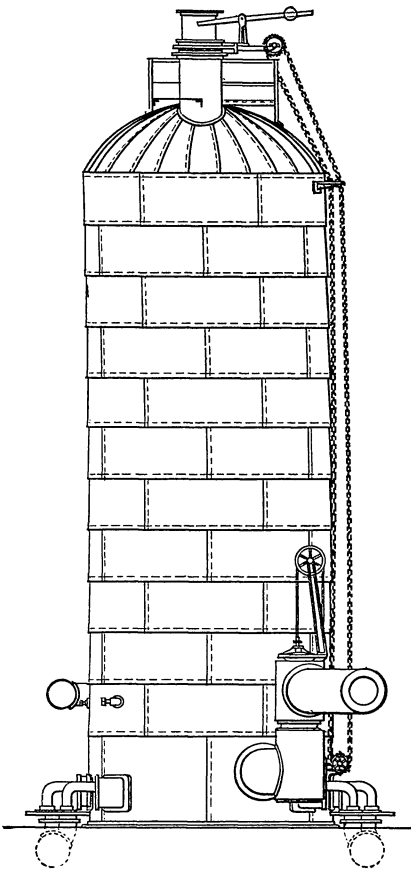


Fig. 2.—Elevation.

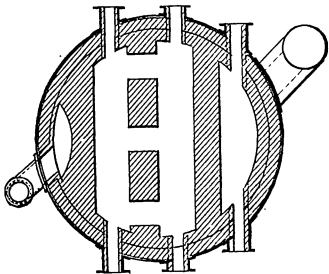


Fig. 3.—Horizontal Section.

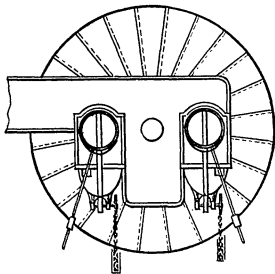


Fig. 4.—Plan.

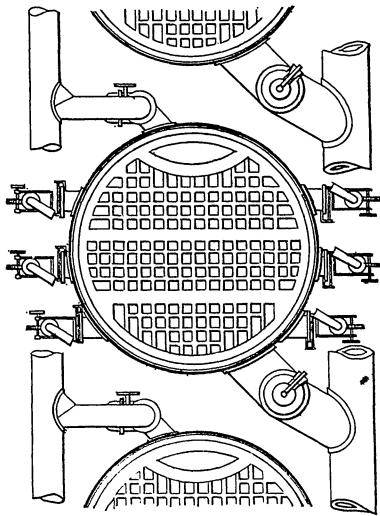


Fig. 5.—Plan.

THE HUGH KENNEDY HOT-BLAST STOVE.

the cast-iron pipe stoves in anthracite and charcoal furnaces.

The brick stoves in general use are of either the Cowper or Whitwell type, or modifications of these bearing the names of those who invented the alterations from the original types rather than any real de-

\*Read at the Schuylkill Valley meeting of the American Institute of Mining Engineers.

proper hight to create the necessary draft. The last passes of these stoves receive a very small percentage of the heat from the gas, owing to their extreme distance from the combustion chamber; and this chamber also suffers great deterioration in the attempt to force the heat into the farthest passes. At best, about 70 per cent. of the heat taken up is held in the combustion

ing proper duty as heat agents, that, after careful study and experiment, he had three 20 x 60 foot stoves constructed with a view of more uniformly heating all the brick. In these the general lines of the Whitwell stove are followed, with the blast connections unaltered, but gas is introduced at the bottom of each pass, and outlets are provided at the top, so that the

gases have a direct natural draft in each pass and the highest heats are obtained at the bottom instead of the top. The natural tendency being toward the reverse condition, the brick work soon acquires an almost uniform temperature. Figs. 1 to 4 sufficiently show the construction. These stoves have been in constant use for about two years and are giving very satisfactory results. The Warwick Iron Company of Pottstown, Pa., have just put in operation three stoves of this type and of the same dimensions as those at Isabella. Plants are being built at other points also. The best practical demonstration of their merits is a careful inspection and study of their operation. It is found that this stove can be kept remarkably free from dust and slag, these being precipitated on the floor by the sudden expansion of the gas in the low chambers.

Moreover, the high heats that often melt the bricks in single combustion chambers are unnecessary here on account of the natural draft and the short passage of the gas.

There is little that is new in the idea. Direct draft was attempted and abandoned in the early days of the stoves, never having been properly directed.

Mr. Weimer patented a stove with one vertical pass or rather a series of passes directly over each other; but in the attempt to supply air at points above the gas supply the draft necessary for combustion was impaired.

Mr. Scovel introduced secondary burners in the third pass of the Whitwell stoves, but these also stopped the draft of the main burner.

To Mr. Kennedy we probably owe the first practical application of direct draft in burning the gas with the consequent advantage of better control of the operation of the stove.

Each of the Warwick stoves has six gas burners, 8 inches in diameter, with 3-inch air pipes in the center. The Isabella stoves are using the same equipment. The combined area of these burners is but equal to one 18-inch nozzle, which I think is about the same area as is used on other stoves, while the small subdivisions certainly obstruct the flow somewhat. Again, both Mr. Kennedy and Mr. Cook say that the stove tenders are likely to burn too much gas rather than too little. It must be borne in mind that each burner is used to heat only one-sixth of the mass of brick.

The Spearman burners, which are used exclusively on these stoves, permit a perfect combustion in the small lower chambers, and, as there are no stacks on the stoves, the draft is light. This allows the time necessary for the brick to absorb the heat.

If all the gas were introduced into one chamber, the heat generated would undoubtedly melt the brick; but as only one-third of the gas burns in each chamber, the large number of flues leading from the chamber carry up the heat toward the top. I have made these observations in frequent inspection of the stoves at Isabella, and have noted that, with about 18,000 cubic feet of air per minute going to the furnace, a temperature of 1350° or 1400° F. was maintained, though the gas burners had not been more than half open at any time while the stoves were on gas.

The opening of the great Yukon River as a highway of commerce the coming spring by a service of side-wheel steamers will be an event in the history of Alaska, and the first boat, now building, will run from St. Michael's Island, 55 miles from the mouth of the Yukon, at which point it will connect with Norton Sound steamers, over 2200 miles up the river.

## The Relations of Chemistry to Foundry Practice.—II.\*

BY CLEMENS JONES, M.E., EASTON, PA.

From this view we have rapidly taken of the chemical elements with which this discussion treats, we are equipped to scan the horizon that now spreads out rather broadly before us, and recognize in approaching objects an intelligent significance of the signals they display, let us hope, in accordance with the codes laid down by the founder's tools and the machinist's lathe. We know pretty well about what objects to expect, and we will proceed in an endeavor to interpret not only the meaning of their appearance, but also to inquire what amounts of each, or all, fulfill the requirements of our search.

**Pig Iron.**—Pig iron is the raw material out of which the foundryman is required to make a finished casting. What is pig iron? Pig iron is impure cast iron. It is metallic iron combined with nearly all of the metals and metalloids that were contained in the raw ores, the flux, and the combustibles employed in its manufacture. As it comes from the furnace it is unfit for any but the simplest castings. Uncertain in quality and weak, it contains blow holes, is liable to chill and to excessive shrinkage, and is full of foreign fragments floated on its molten surface, as it rises to the top of the mold. This crude iron is in a condition to be cheaply purified and converted into articles most needed in the arts. In the early centuries, before cast iron became in vogue, pure iron was sought as a direct product. The direct process was used until the fifteenth century, and is still extant, notably in China, India and Africa. But these charcoal bloomeries required the finest selected materials, and involved tremendous labor and great expense. Besides, there is no use for chemically pure iron in the arts. On this account its manufacture is not attempted. But iron is combined with other elements, which we regard as impurities, until it has a required hardness, combined with a required strength. The elements employed to effect this change in the physical properties of iron are commonly carbon, silicon, phosphorus and manganese. As we have seen, there are other accidental impurities possible, which may comprise the whole list of elements we have discussed. Nature, provident in this, the greatest need of mankind, disposed of these needful elements in such relation to the deposits of iron ores that crude iron—the alloy with requisite properties—is readily produced, suited to the needs of the artisan. Indeed, so wide is the range in this respect that in earlier days quantity only, without respect to the quality, of the pig iron, was the sole object. Materials were tumbled into the blast furnace without rhyme or reason, and in utter disregard of those self-controlling conditions of the process itself which alone were often responsible for a product that was fit for any purpose. Or, on the other hand, the founder's complaints to the furnaceman prevailed in such incessant changes of materials that by an accident of experiments the proper iron was at last made. Without doubt this state of affairs retarded any considerable progress in foundry practice. But blast-furnace practice has undergone a revolution. Chemical knowledge has brought it about. To-day the foundryman is in a position to say to the pig-iron makers, "I want such a quality of iron;" and the furnace manager is in a position to light his fires and make it. The pig-iron industry is of such great importance

that, independent of economical considerations, he will be obliged to make it. The report of the mineral products of the United States just distributed places the production of pig iron for the year 1891 at nearly 8,300,000 tons, having a value at this city of over \$128,000,000. We may, therefore, look confidently to the present day as the dawn of light upon subjects long in darkness. Good workmanship in the foundry requires intelligent methods. These begin with the selection of appropriate materials—those having the right composition. It stands to reason that foundrymen are restricted when they undertake to handle material concerning which they do not possess any chemical knowledge.

While pig iron is usually weak and unreliable, there are instances on record of very strong irons. A good pig iron should stand a breaking strain of at least 15,000 pounds to the square inch. A well-known brand of Pennsylvania iron has an average tensile strength of 17,000 pounds to the square inch. The first remelting of this iron gives a strength of over 22,000 pounds. One test of this brand of iron gave in a gray forge iron the unusual strength of 52,000 pounds to the square inch.

We will not spend much time on the subject of the grades of pig iron. Grading at best is but a local designation. It has the advantage, however, of approximating to the end in view. The grades of pig iron with reference to fracture, may be classed in the following order: Silver gray, brittle, large bright crystals, open grained. 1x, tough open grain free to edges; torn fracture, jagged to the touch. 2x, similar to 1x, but having close-grained spots. 2; even close grained. 3, or gray forge, hard and finely grained. 4, or mottled and white irons. The composition of pig iron, taking the average of the Pennsylvania brand mentioned, for foundry use is about as follows:

	Per Cent.
Carbon, graphitic.....	3.75
Carbon, combined.....	0.20
Silicon.....	2.50
Phosphorus.....	0.75
Manganese.....	0.30
Sulphur.....	0.06
Total.....	7.29
Iron, &c.....	92.71
Total.....	100

Iron of this composition will answer for general use, will be fluid and make a strong, soft casting. We find from the analysis the amount of each ingredient. Now, in actual practice, we will suppose that this given iron is entirely satisfactory when made into castings for a certain purpose. It melts easily, requiring a modicum of fuel, fills every crevice in the mold, comes out a perfect casting, and can be readily shaped on a lathe. This quality of iron, then, would naturally be sought for similar work. What is there in the appearance of pig iron to indicate its quality? Grading by fracture will not determine quality—that is, composition. Grade alone, judged by the fracture, is of no practical service whatever. Taken in connection with known composition it is of valuable assistance. There are claims held by reputable iron men that the fracture indicates carbon, silicon and every other constituent, presumably to the practiced eye. Still others hold that the face of the pig is an infallible guide for everything. Relied upon by itself there can be nothing more deceptive; the eye, no matter how finely educated, cannot see phosphorus, sulphur, silicon or anything else in an opaque, solid mass. If the blast furnace produced iron at each successive cast of perfectly uniform composition there might be a shadow of validity to such claims, since the free carbon as graphite under regular conditions, is a fairly good indicator. But it has been clearly shown

\* An address before the Foundrymen's Association of Philadelphia.



by the best authorities that the two principal ingredients, carbon and silicon, are liable to be affected not only by the temperature of the iron, but the rate of cooling and other physical causes, other conditions being constant. As a matter of fact, not only do graphite and silicon vary in different casts, when using the same mixture of ores, &c., but there is even marked variation between the pigs in the different beds. It is asserted on good grounds that graphite is an index of silicon, for the reason that in certain amounts it changes the combined carbon to graphite—that is, precipitates it. But what visible means is there of determining exact amounts of silicon? There are many recorded cases of rich open grained irons that in reality contained hardly enough silicon to make the melted iron pour without clogging. Analysis from this array of facts is the only true guide. In these connections the relations of chemistry to foundry practice cannot be misapplied. Here a practical illustration may be of service. Pig iron is introduced into a cupola, fuel is added, flux is added to take up the excessive impurities, a current of air is blown in to increase the heat. The pig iron was smelted from its ores—chemical forces operated to produce it. The fuel, as we have seen, is a form of carbon—a chemical substance. Lime is the base of the flux employed; it unites with the acid impurities to form a liquid purifying bath—by chemical reactions. Oxygen, the tireless vital principle of the air, causes the combustion of the fuel with generation of intense heat—a type of chemical energy. The molten fluid metal, sparkling in the ladle, fills every crevice of the mold, and is at last uncovered from the steaming sand—a chemical product.

Cast iron is that kind of iron which neither tempers nor welds. This is rather a distinction than a definition. It compares with steel, which is that kind of iron capable of assuming temper, and with wrought iron, which may be welded, but will not take temper by chilling. There are, however, qualities of steel which may be welded, bent, and do not take temper. But to a certain extent these distinctions are caused by the behavior of carbon, and at the same time the absence of certain other elements. White iron becomes steel when its carbon is reduced to about 1.5 per cent., at which point it has slight weldability and great hardness. We may say that cast iron is a compound with varying quantities of carbon and silicon. Steel may contain silicon, but has less carbon than is needed to form cast iron. Wrought iron is nearly pure.

Let us now briefly examine the influence of the chemical elements with which we have become acquainted upon the quality of cast iron. When pig iron is melted in a cupola we look for a slight change of composition in the resulting cast iron, owing to oxidation caused by the blast of air. The tendency of this effect is to lessen the amounts of the more readily oxidizable elements, such as manganese and sulphur. Silicon and combined carbon afford combustible material to oxygen, and these elements are burned and also reduced in quantity. The practical effect, when a mixture contains the right proportion of carbon, silicon, phosphorus and manganese, is a uniform iron, in which, so to speak, the carbon as graphite is finely subdivided. This state of subdivision, in which all the carbon is still graphite, increases the tenacity between the particles of surrounding metal by placing them in closer contact and imparts a texture resulting in greater strength. By the same process, it is well known that up to a certain point subsequent remeltings give greater strength to cast iron, which from the first melting may be even doubled. We do not know accurately whether in addition to this the alloy may not be said to

be intensified and a firmer grasp upon each other given to the combining elements. But the texture is improved by a rearrangement in molecular structure, and the actual composition may not have varied to any considerable extent. Illustrative of the effect of melting on pig iron, the following analysis, quoted by one of the greatest authorities on the subject of iron, will be instructive in several ways. The iron was graded as No. 1 pig. On remelting, it turned hard and white. The analysis of the original pig, and as remelted for castings, was as follows:

	Pig.	Castings.
Carbon.....	1.61	1.65
Silicon.....	0.98	0.61
Phosphorus.....	1.37	1.25
Sulphur.....	0.16	0.29
Manganese.....	0.12	0.47
Calcium.....	0.40	0.81
Magnesium.....	0.29	0.43
Total.....	4.93	5.51
Iron.....	95.15	94.42
Total.....	100.08	99.93

Observe that phosphorus and silicon sustained a loss, but the carbon remained practically the same, and sulphur and manganese increased, as well as the other two ingredients. Now, the phosphorus and silicon were oxidized, but the carbon was in all probability entirely graphitic. The gain in sulphur and manganese was undoubtedly due to bad fuel—a frequent source of trouble to the foundryman. Previous analysis of this particular pig iron would have avoided all difficulty. A critical study shows that it was deficient in carbon—should have contained twice as much. With the low silicon—of which the same holds good—this iron would have turned white, supposing that sulphur and phosphorus were not excessive. The abnormally high phosphorus and sulphur only increased the hardness of the metal. The gain in manganese is unusual, and had reached a point where, with the other constituents normal, chilling is so often sure to follow. Of calcium and magnesium, aside from the correctness of the analysis, the effects need not concern the result. But it is highly probable that had carbon and silicon been normally high, the increase in these elements, as well as sulphur and manganese, would have been prevented. Now, the analysis would have shown the deficiencies in this iron. With a knowledge of the chemical effects of these elements on cast iron, no foundryman would have attempted to melt this iron alone. It is important to understand clearly the fact that these chemical effects produce physical properties. The remedy is simple. The analysis points it out. A mixture of this iron with another iron containing more carbon and silicon and less phosphorus and sulphur, so as to result in a composition corresponding to that of the Pennsylvania iron, would have made soft, strong castings. Hence the practical application of chemical analysis to the materials used in the foundry is apparent.

The quantities of the chemical elements in cast iron giving the best physical and economic results have been fairly well established. They may be considered in their relation to cast iron as hardeners and softeners. Carbon is a hardener. In pig iron carbon rarely exists over 5 per cent. Metallic iron is capable of combining with even 7 per cent. as a maximum. Beyond this amount it separates out as graphite, of which "kish" is an example. But part of the carbon is replaced by the other elements, as already pointed out. As a consequence it rarely exceeds 4 per cent. In the condition of graphite the range in cast iron is from 3.5 to 4 per cent., in which amounts it imparts the greatest strength, for which purpose it is necessary. Carbon makes iron work hot and gives it fluidity. It makes it soft and easily cut by a tool. Silicon is the regulator of carbon in cast

iron. Cast iron comparatively free from other elements and high in combined carbon is white, crystalline, hard, brittle and may be specular. Silicon appears to change the combined carbon to graphite and produces gray iron. It therefore adjusts carbon to make cast iron hard and strong or soft and tough. The range of silicon is wider than that of carbon. Over 3 per cent. of silicon gives hardness to cast iron and increases shrinkage. At 2.5 per cent it gives maximum fluidity to cast iron, which can be used for the thinnest castings. But if a large casting, to be subjected to tensile strength or to resist a great crushing weight, the amount of silicon should be less. Silicon thus plays the part of both hardener and softener. Cast iron is soft and easily worked, containing from 2 to 2.5 per cent. of silicon. For common castings, such as pipe, &c., even 1.75 gives good results. Phosphorus should always be well controlled. With proper adjustment of the other ingredients it makes iron hard and causes excessive shrinkage. Some authorities consider 0.50 per cent. all that is necessary, but more than this amount may be safely employed. The range, however, is more limited, and, except where very fluid iron is required, should not exceed 0.80 per cent. High phosphorus sometimes results in hard spots in castings. Manganese makes iron brittle and increases shrinkage, chilling and hardness. It weakens iron and reduces its ability to stand stress. On this account more than 0.40 per cent. is undesirable in ordinary cast iron. It is a useful ingredient in making chilled castings, such as rolls, &c. Above 1 per cent. the hardening properties are lessened. Sulphur is one of the ingredients whose presence is not sought. It is a great hardener, and appears to increase combined carbon, which, as seen, is inimical to soft iron. It is always injurious to iron. In wrought iron sulphur causes brittleness at a red heat, and makes it "red short." This property is opposed to the influence of phosphorus, which makes it "cold short" at ordinary temperatures. But these terms do not properly apply to cast iron, although there is an old foundry saying, that a neutral iron may be made by combining red and cold short iron. Aluminum exists in such small proportions in cast iron that its influence is not often felt, but it appears to impart strength and elasticity. Introduced into melted iron, it is considered to act beneficially by collecting scum and slag, and produces sounder castings free from blowholes. Arsenic acts very much like sulphur on cast iron and is as greatly to be avoided, although but seldom encountered. There is no evidence to show that titanium injures cast iron, perhaps one reason being that it occurs in only small quantities. Copper is a hardener of iron, and in appreciable amounts weakens it. The other rarer elements, nickel, chromium, tungsten, &c., are so rarely to be found that their effects on cast iron are not accurately understood. They have been more used in connection with steel, the strength of which they appear rather to increase than diminish. But their occurrence in pig iron, and our knowledge of the fact, will pave the way to any future enlightenment concerning the effects they may produce. Cast iron, with the properties generally required, we may consider to be of a composition of from 3 to 4 per cent. carbon; 1.75 to 2.75 per cent. silicon; 0.25 to 0.85 per cent. phosphorus; 0.15 to 0.35 per cent. manganese, with as few other impurities as possible. The final point in our discussion is, as to whether it is better to depend on chemical analysis or upon practice in making iron castings. There will be no dissent from the opinion that they must and will go hand in hand. Since we can govern the amounts of the ingredients of cast iron,

any desired property may be given to castings of which it is composed.

There is no law as yet resulting from the commerce between the laboratory and the foundry. Without doubt, there is too much to learn that prevents the formation of simple, definite rules applicable to modern foundry practice. But these will come in time as the relations of chemistry to foundry practice become better and more generally understood. There are a thousand minds at work on the problems of science—chemists thinking in every language of the civilized globe of the subjects we have here discussed. Science improves every industrial condition to which it is applied.

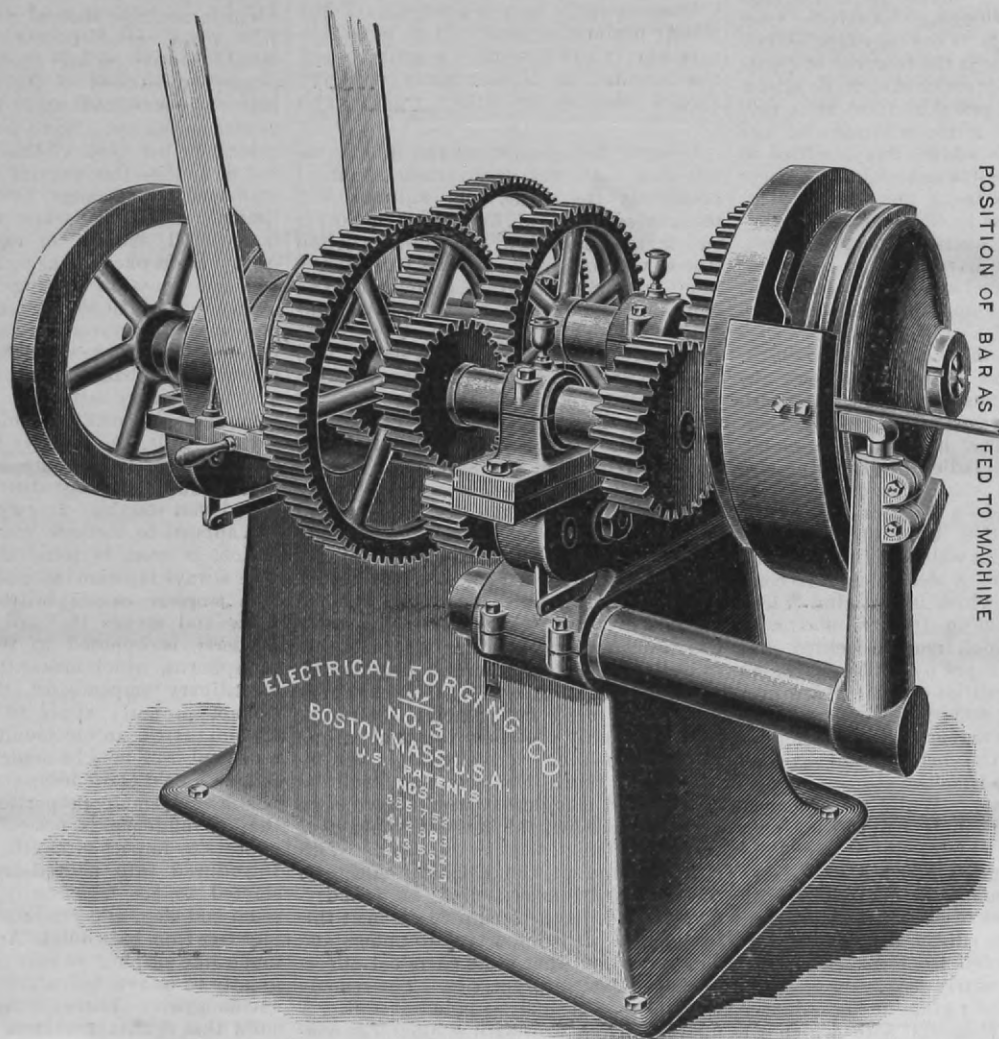
in respect to the number of apprentices they should employ; and when they submitted to his dictation and apologized for seeking to do their own business in their own way instead of his, extorted money from the firm as the price of forgiveness"—a proceeding which he called "soaking" the manufacturer.

#### Machine for Rolling Electrically Heated Bars.

The accompanying cut shows the latest patent rolling machine for rolling odd shapes from electrically heated bars, built by the Electrical Forging Company of Boston.

screw, a bolt with thread and head complete, a boiler rivet, small calks for lumbermen's shoes, or a spindle or taper pin, &c. It is evident, therefore, that the output of the machine depends solely upon the speed at which it is operated, and, as the movements are all rotary, this speed may be very high. The small engravings show some of the work produced. The right and left thread, Fig. 10, was made at one operation.

J. Y. McClintock, City Surveyor of Rochester, N. Y., has furnished to the *Engineering News* some interesting data to show the effect of corrosion by loco-



MACHINE FOR ROLLING ELECTRICALLY HEATED BARS.

It is not possible, with accumulating facts rising to activity, that even in so humble a factory as the iron foundry they may not find practical application from day to day.

The court rendered another important decision when it affirmed the judgment of the lower court convicting James Hughes, a typical "Labor" leader, of the crime of extortion, and sentencing him to a year in the penitentiary. Hughes was Master Workman of the Cutters' and Trimmers' Branch of the Knights of Labor, and took \$1000 from a firm of clothing dealers in Rochester, as he said, for defraying the expenses of raising a boycott which had been declared against the firm on account of a dispute between the firm and its employees regarding the apprenticeship question. It was established that he devised and put into operation a scheme for destroying the business of this firm "because they did not at once obey his commands

This machine was designed and built for rapid and accurate work. Since it is rotary in all its movements, no time or power is lost in the return of the dies to their working position. The machine is quickly and easily adjusted and automatic in all parts, and works from  $\frac{1}{8}$  inch up to 6 inches long and from  $\frac{1}{8}$  inch to 1 inch in diameter. By heating the metal electrically highly carbonized steel may be worked as well as iron or soft steel. It is within the range of these machines to roll successfully steel of the highest grade of crucible down to open hearth and Bessemer. Copper and brass have also been worked.

One of the most important claims made is found in the rapidity with which the articles can be produced.

A red-hot steel bar is inserted between the revolving dies (the position of the steel bar is shown in the cut of the machine) and for every revolution of the dies a ball is forged, or a conical shot, a chair

tive gases on an overhead bridge. The bridge in question carries East Main street over the main tracks of the New York Central & Hudson River Railroad at the west end of the company's freight yard in East Rochester. The bridge is 112 feet 1 inch long, and its top and bottom chords of the triangular truss are made up of angles and webs. The bridge was built in 1879, and in August of last year, after 13 years' use, measurements were taken to ascertain the effect of corrosion. The measurements covered a number of angles, and showed a decrease in section varying from 25.9 to 61.5 per cent., it being over 40 per cent. in most of the angles measured. The web plates exhibited similar loss of metal.

Labor organizations, through their committees in attendance on the legislatures now in session, are making diligent efforts to give shape to bills under discussion.



They would secure through legal enactments those ends which they failed to secure by other methods, some of which are acknowledged mistakes.

### The Value of a Trade Name.

In discussing stove trade matters recently a very prominent manager made the striking assertion that if he were given the choice between the right to use the trade-mark of his company and their entire property in plant, including ground, foundry, machinery, materials on hand, &c., without the trade mark, he would instantly take the former, even without a dollar to back it up. It was strong testimony to the value of a good name, long before the public, known in almost every home in the land, and known also as a guarantee of high quality. The name of the company was regarded as of no consequence. Without the use of the well-tried and thor-

oughly advertised trade name the company would find itself without a market. The same superintendent might run the same foundry with the same set of molders on the same patterns, but his customers would want the old name on their goods or else be educated by a long and tedious process to the fact that the stoves offered them were just as good as those they had been in the habit of buying. The old trade-mark given to a new foundry would spring at once into the possession of a trade empire, in which it had been the acknowledged sovereign, and from which it could not be driven, except, perhaps, by immense expenditures and only after a long period of persistent warfare.

There is vastly more in a trade-mark than merely business egotism. Every manufacturer who thinks it worth his while to lay the foundations of an enduring business should adopt a distinctive name for his

### Serve's Ribbed Steel Boiler Tubes.

Chas. W. Whitney, of New York, has just taken an order for 1840 Serve's ribbed steel tubes,  $3\frac{1}{4}$  inches diameter by 10 feet  $3\frac{1}{4}$  inches long, for the new Fall River steamer, which is to eclipse in size, speed and in the elegance of her appointments any steamer of her class hitherto built in this or any other country. The engines and boilers are being built by the W. & A. Fletcher Company of Hoboken, N. J., from whom the order comes. The steamer is to have ten boilers of the Scotch marine type, 14 feet in diameter and  $14\frac{1}{4}$  feet long, each boiler to be fitted with 184 of the above tubes.

With plain tubes the consumption of fuel by this steamer was estimated at 160 tons per round trip between New York and Fall River, and it is estimated that the saving in fuel or increased steaming capacity by the use of ribbed tubes will



Fig. 2.—Machine Handle.

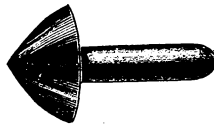


Fig. 6.—Shuttle Tip.



Fig. 10.—Right and Left Thread.



Fig. 11.—Cane Tip.

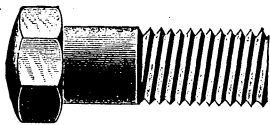


Fig. 3.—Hexagon Head Bolt.

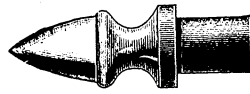


Fig. 7.—Hinge Tip.



Fig. 12.—Bicycle Spindle.



Fig. 4.—Shoe Calk.



Fig. 8.—Hinge Tip.



Fig. 13.—Caster Pin.



Fig. 5.—Conical Shell.



Fig. 9.—Hames Start.



Fig. 14.—Caster Pin.

### SPECIMENS OF WORK DONE BY MACHINE FOR ROLLING ELECTRICALLY HEATED BARS.

oughly advertised trade name the company would find itself without a market. The same superintendent might run the same foundry with the same set of molders on the same patterns, but his customers would want the old name on their goods or else be educated by a long and tedious process to the fact that the stoves offered them were just as good as those they had been in the habit of buying. The old trade-mark given to a new foundry would spring at once into the possession of a trade empire, in which it had been the acknowledged sovereign, and from which it could not be driven, except, perhaps, by immense expenditures and only after a long period of persistent warfare.

An interesting episode, illustrative of the difference between a widely advertised name and the mere name of a company has since then fallen under our notice. A stove manufacturer visited a neighboring city, and while there concluded to call upon a fellow manufacturer, whose company, if mentioned, would be recognized as one of the best known in the country. Having arrived, as he supposed, in the immediate vicinity of his friend's foundry, but seeing no sign of it, he entered, ac-

products and not change it. Year in and year out, day by day and every day, he should keep the name before the trade until it became better known than his own. Occasionally, in the case of something having special merit but which has never been named distinctively, the trade will, through some curious chain of circumstances, coin a name by which the article will be known. This is in accordance, evidently, with a natural trade law out of which the trade-mark has grown. The name of a company, or more especially of a firm, is too long for mankind generally to bother with. A short name takes the fancy. If it is particularly smooth, snappy or euphonious, and if, moreover, it represents a really high-grade article, it makes an impression on the minds of those interested which is almost ineradicable.

Scandinavian immigration promises to form a larger proportion of the total arrivals in American ports this season than usual, as there is no suspicion that cholera may enter from that direction and no impediments will be raised. Fortunately, natives of Sweden and Norway are among the most desirable of imported citizens.

be at least 10 per cent. It is claimed that at the present cost of Anthracite coal in New York, viz., \$4.30 per ton in the bunkers, ribbed tubes pay for themselves in two years' service, and then make half their cost every year for the owners of the boat during the balance of their lives, which is estimated at five years, the total life of the tube under usual conditions in marine boilers averaging seven years.

In the criminal courts at Pittsburgh last week, Hugh F. Dempsey, master workman of District Assembly No. 3 of the Knights of Labor, was found guilty as indicted on the charge of administering, or causing to be administered, poison, with intent to commit murder, to Wm. E. Griffith, a former waiter in the Homestead Steel Works. The attorneys for the defendant have announced that application will be made for a new trial.

The Board of Assessors in Brooklyn reports that the assessed values of real and personal property in that city for 1892 were \$483,738,129, an increase of \$16,823,880 over the valuations of the previous year.

## The Yellow Phospho-Molybdic Salt.

(From Notes by Eggertz.)

BY WILLIAM MOLIN, NEW YORK.

It is well known that the so-called "direct" method for phosphorus determinations is used very generally in European iron works' laboratories. In this country, however, when the gravimetric method is used, it is generally the custom to dissolve the yellow precipitate and reprecipitate with magnesia mixture, the reasons for this being, so far as my observations go, either an unfounded suspicion as to the composition of the yellow salt, or unfamiliarity with the several details which must be observed in order to obtain correct results with the direct method. It has been stated by some chemists who have tried this method that they thought that the results they obtained were too low. But the probability is that these same chemists would have obtained doubtful results with the magnesia method also, for if all the phosphorus present has not been precipitated with the ammoniac molybdate it is difficult to see how things can be mended by the magnesia mixture.

The object with these lines is not to advocate the preference of any method, but as the direct method has the advantage of being both a rapid and convenient one, at the same time it is not surpassed by any method for accuracy, the following data may be of some interest to those who have not had the opportunity of making themselves familiar with them.

Investigations with reference to the yellow precipitate have been made by several chemists, of whom Svanberg, Struve, Seligssohn, Nutzinger, Sonnenschein and Eggertz have made their results known in metallurgical journals. It was in the year 1848 that Svanberg and Struve discovered that a yellow precipitate was obtained when ammoniac molybdate is added to a solution containing the least traces of *b*-phosphoric acid, which precipitate consists of molybdic acid, phosphoric acid, ammoniac oxide and water. Below are the results of analysis of the yellow salt obtained by some chemists up to the year 1856:

	Svanberg and Struve.	Seligssohn.	Nutzinger.	Sonnen- schein.
Molybdic acid.....	86.881	90.744	92.70	86.08
Phosphoric acid....	3.631	3.142	3.82	3.02
Ammoniac oxide....	9.488	3.570	3.48	11.18
Water.....		2.544		

Of course these analyses have only a historical interest, and the discrepancies are probably not larger than those in other chemical work by different chemists at that time. Undoubtedly the salt was prepared under different conditions, which also accounts for the difference in results. The low per cent. of phosphoric acid obtained by Sonnenschein may be explained from the fact that this chemist dried the salt at 120°, at which temperature part of the phosphoric acid becomes converted into *b*-phosphoric acid, which cannot be estimated by precipitation with magnesia mixture, being soluble in an ammoniacal liquid.

It is, however, the investigations made by Eggertz that have a really practical value, as they were carried on both under different conditions and during a long period and successfully applied to the *s. c.* direct method, the details of which were so modified and improved on by Eggertz himself some 12 years ago, that the results obtained by this method are as correct as those obtained by the best methods

in use at present. The composition of the yellow salt is stated by Eggertz to be as below:

	Found after drying at 95°.	Calcu- lated after drying at 95°.	Calcu- lated after drying at 140°.
Molybdic acid .....	91.28	91.69	92.24
Phosphoric acid. ....	3.74	3.72	3.74
Ammonia oxide.....	3.31	3.41	3.43
Water.....	1.32	1.18	0.59

## Properties of the Yellow Salt.

The salt retains its yellow color at a temperature of 325°, but becomes black at 400°, is non crystalline, and has 4.17 specific gravity after drying at 140°. One part of salt is soluble in 10,000 parts of water, in 6600 parts of 1 per cent. nitric acid, in 550 parts of hydrochloric acid of 1.12 specific gravity, in 620 parts of alcohol of 0.80 specific gravity, and in 190 parts of nitric acid of 1.2 specific gravity at 50°. One part of the dried salt is soluble in 3 parts of ammonia of 0.95 specific gravity, and in 5 parts of concentrated sulphuric acid at a temperature of 100°. The salt was found to be insoluble in liquids containing one-half their volume of ammoniac molybdate. For this reason, and also in order to effect a complete precipitation of the phosphorus the amount of ammoniac molybdate must not be less than one-half of the solution in which the precipitation is to be made.

The reason why Eggertz in his first article (1859) on phosphorus determinations prescribed the heating of the iron solution at only 100° was that, according to opinions prevalent at the time, *c*-phosphoric acid otherwise might be converted into *b*-phosphoric acid, which can not be precipitated with ammoniac molybdate. But some years after the publication of this article it was stated that it requires as high a temperature as 213° to convert the *c*-phosphoric acid in the *b*-modification, that it requires ignition to convert it into *a*-phosphoric acid, and that the two latter modifications can again be converted into *c*-phosphoric acid by the addition of nitric acid. Another reason was that, if the arsenic was to be estimated in the solution after the filtration of the yellow precipitate, this could not be done if the solution had been heated at more than 100°, because it was thought at the time that arsenic chloride was not volatilized at or slightly below a temperature of 100°. Later experiments, however, with weighed quantities of arsenious acid in strong hydrochloric acid showed that the arsenic volatilized in a few hours on the water bath.

It was not until some 10 or 12 years since, I think, when some chemists began to heat the iron solutions to dryness at a temperature of 200°, that the old method by Eggertz was found to give too low results. From investigations made by him at that time, Eggertz held the opinion that the phosphoric acid which is not precipitated by ammoniac molybdate in nitric acid solutions that have not been evaporated to dryness at a high temperature must be some other modification than *a*, *b*, or *c* phosphoric acid. That this is probably the case seems confirmed by the fact that no precipitate is obtained by ammoniac molybdate in a solution of *a*-phosphoric acid in water alone, whereas a precipitate is instantly obtained if the solution previously has been heated with nitric acid. In order to effect a precipitation of this fourth modification of the phosphoric acid it must be converted into *c* phosphoric acid by combining it with a base, either direct by separation with the oxide of iron or by combination with the basic iron salt, by heating it at a temperature of 200°. In whichever way the combination is effected the result will be the same.

From the above extracts from Eggertz's experiments it is proved that there is no reason why accurate results should not be obtained by weighing the yellow salt, if

the necessary details are observed. Regarding these I will only state that the smaller the volume of liquid in which the precipitation is to be made the better, and it should not exceed 20 c. cm. In such small volumes of liquid complete precipitation is effected within half an hour at 80°, and the drying at 120° is effected within the same length of time. Lately I have noticed some steel works chemists who are in the habit of collecting the yellow salt in Gooch crucibles, drying at 80° to 85°, and cooling for an indefinite time before weighing, using no covers on the crucibles. It is evident that such manipulations must produce absolutely worthless results. I understand that the composition of the yellow salt has recently been the subject for further investigations by Hundeshagen, who is said to have confirmed the per cent. of phosphorus obtained by Eggertz. This is both the more interesting and gratifying to those who have had implicit confidence in the analytical methods in general use by Eggertz, none of which have been improved on as yet by other chemists.

## Exports to Reciprocity Countries.

From the advance sheets of the report of the Bureau of American Republics for 1892 is obtained a table from which may be gained some idea of the workings of the various reciprocity arrangements entered into under the McKinley law. It gives the total value of the exports of the principal articles shipped from the United States to the Latin-American countries for the first eleven months of 1891 and for the same period of 1892, as follows:

	1891.	1892.
Agricultural implements..	\$668,652	\$1,863,286
Corn .....	1,189,165	4,486,043
Wheat flour .....	13,140,086	14,755,764
Carriages and cars .....	2,248,843	1,249,022
Coal .....	1,982,863	2,955,892
Manufactures of cotton..	4,115,742	4,510,419
Builders' hardware, saws and tools .....	1,484,135	1,806,271
Sewing machines .....	711,885	690,686
Steam engines and ma- chinery.....	7,042,794	6,684,405
Fruits, nuts, hops and seeds.....	279,737	274,505
Leather .....	58,116	49,163
Rosin, tar, pitch and tur- pentine.....	543,676	679,290
Refined petroleum .....	3,123,833	3,185,249
Cottonseed oil .....	255,598	280,426
Canned, salted and pickled and other cured beef and tallow .....	919,480	1,032,966
Bacon .....	1,259,297	849,246
Hams .....	615,433	92,895
Fresh and pickled pork...	1,981,888	2,188,623
Lard .....	5,308,946	5,381,685
Butter .....	707,939	768,398
Cheese .....	223,707	250,742
Refined sugar .....	392,871	429,632
Tobacco and manufact- ures of .....	853,508	976,394
Lumber and timber for building purposes .....	5,019,303	5,923,258
Furniture and other man- ufactures of wood.....	1,570,592	1,497,683
Total .....	\$55,695,644	\$62,802,003

The report of the Congressional Committee to investigate the Reading deal, besides expressing an opinion that the railroads concerned practically constitute a combination to control the output of coal and to fix the prices, recommends as a means of protecting independent coal operators against discrimination on the part of the coal producing and transportation companies that the Interstate Commerce law be amended to meet the effect of the Gresham and Counselman decisions, and that the long and short haul clause be made applicable to railroads which form connecting lines. The committee finds, moreover, that while coal can be transported at less cost and risk than almost any other class of freight, charges for carrying coal are usually about double the rate for wheat or cotton, and the excess constitutes a fund with which to crush out independent coal producers. The committee concludes that the public interest demands that the business of the common carrier should be ab-

solutely divorced from any other business, and that some way of solving the problem must soon be devised by Congress and the States.

### The Lodge & Shipley Lathe.

The Lodge & Shipley Machine Tool Company of Cincinnati are placing on the market a powerful lathe intended to do heavy cutting very rapidly and designed especially for handling the details of Cor-

The carriage is extremely rigid. It is fitted with taper attachment, with extra tool block to turn the full swing, and where the nature of the work requires it the tool block, as now shown, with a single tool, may be changed to receive three or four tools with suitable devices to set same, so that in facing down a given surface, say 30 inches, instead of feeding 15 inches, if five tools are held in position only 3 inches of feed would be necessary.

The lathe is provided with power length and cross feed with three changes. The turret has a movement of 30 inches to and from the chuck, and is fitted when ordered with a cross movement instead of the plain, straight movement, as shown.

The feed for this turret is provided with positive clutch and with worm and hand movement in order to approach large surfaces with heavy tools and give the neces-

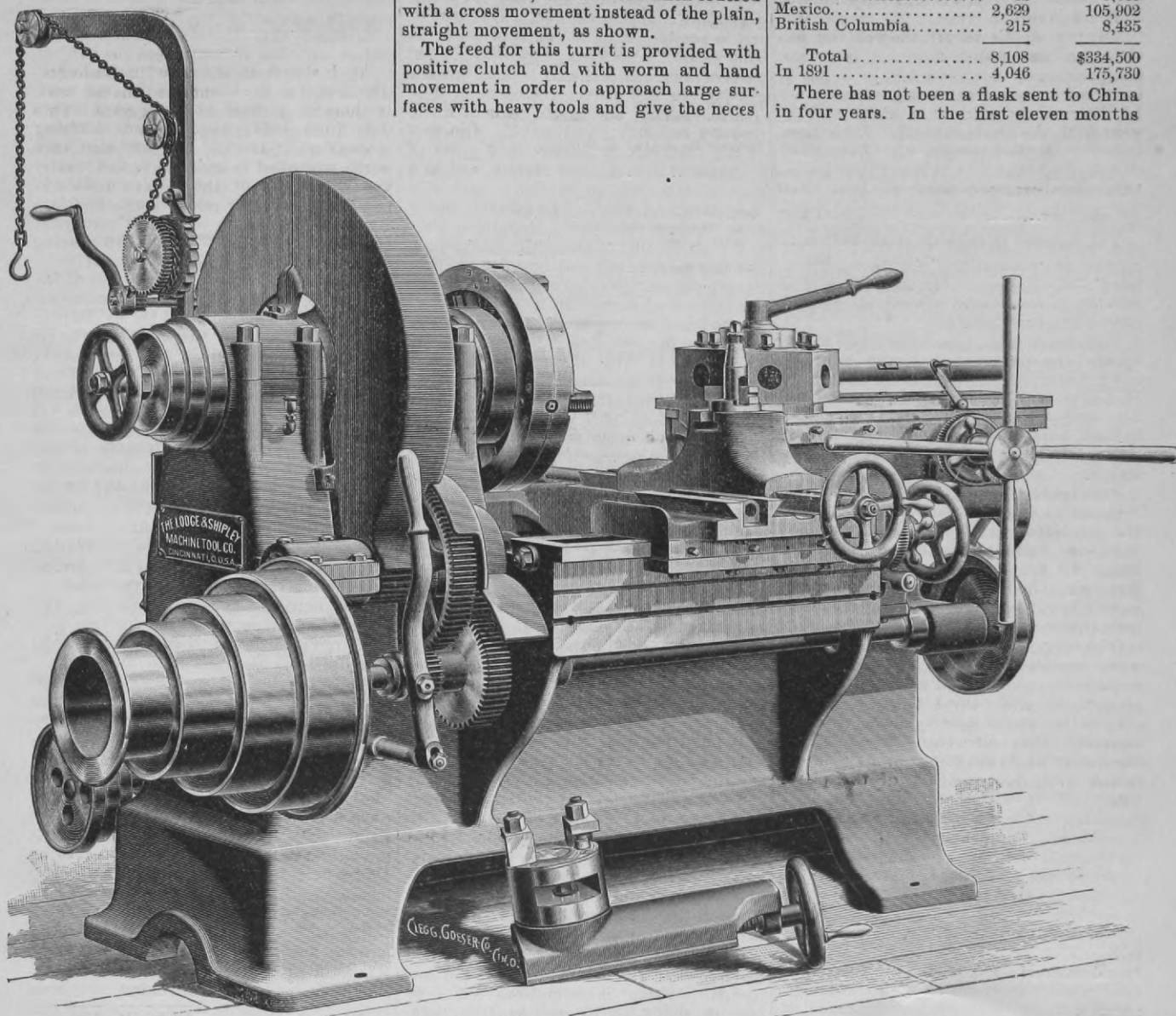
**The Quicksilver Trade.**—The receipts of quicksilver at San Francisco for December and for the year 1892 were as follow:

	December.	Year.
1890.....	flasks 1,182	12,947
1891.....	1,287	14,982
1892.....	2,000	20,000

The exports by sea in December were 1,050 flasks, of which 1,000 flasks came to New York and 50 flasks went to Mexico. The shipments for the year were as follow:

	Flasks.	Value.
New York.....	4,800	\$180,800
Australia.....	762	31,047
New Zealand.....	160	6,647
Central America.....	42	1,669
Mexico.....	2,629	105,902
British Columbia.....	215	8,435
Total.....	8,108	\$334,500
In 1891.....	4,046	175,730

There has not been a flask sent to China in four years. In the first eleven months



THE LODGE & SHIPLEY LATHE.

liss engines, slide valve engines and any cast iron or wrought iron that can be held in a chuck, and on which various operations are to be performed.

The entire frame of the machine is cast in one piece, including the head in which the spindle fits and the ways upon which the carriage moves and the ways in which the turret slide is fitted. The spindle is 6 inches in diameter and has a 3 $\frac{1}{4}$ -inch hole clear through it.

When the back gear is thrown in the cone pulley makes 30 revolutions while the spindle makes one. When the back gear is thrown out the cone pulley makes two revolutions while the spindle makes one. The nose of the spindle, to which chucks or face plates are attached, is 9 $\frac{1}{4}$  inches in diameter and chased two threads to the inch, and will receive chucks, face plates, &c.

sary power to force the tool against the work.

The steel crane as shown is also provided so that the operator may handle his work alone.

The hand wheel shown at the back end of the live spindle is used only when work is being turned on a mandrel. This hand wheel connects with a screw which draws the turning mandrel into place, making it form a part of the live spindle, its object being extreme rigidity whether the outer end is supported or not.

The center may be put into the turret, and the outer end of the mandrel supported where the mandrel is very small or too long to be sufficiently rigid.

All the elements of the screw are provided for forcing the center up and locking it when in this position. The weight is 4500 pounds.

of 1892 there was exported overland by rail 13 912 flasks, valued at \$587,816, against 10,213 flasks for the same time in 1891, valued at \$465,147. The returns by rail for December, 1892, have not been made public.

Advices from Mexico speak of the short route to the Pacific across the Isthmus of Tehuantepec as promising a speedy opening. The railroad, it is said, will be completed before the terminal harbors can be got in readiness, and if it shall be as fairly managed as President Diaz says it will be San Francisco merchants expect that Californian commerce will be given a new impetus. The Tehuantepec route, it may be remembered, some years ago came into possession of the late Mr. Learned of Pittsfield, Mass., through a concession obtained from the Government, but which



was forfeited after a large amount had been expended in the purchase and shipment of materials.

### The Report of the Edison Electric Illuminating Company.

At the annual meeting of the Edison Electric Illuminating Company of New York, the following Board of Directors was elected: A. A. H. Boissevain, R. R. Bowker, C. H. Coster, Charles E. Crowell, Thomas A. Edison, J. Buchanan Henry, E. H. Johnson, D. O. Mills, Geo. Foster Peabody, F. S. Smithers, Spencer Trask, Henry Villard, J. Hood Wright.

The president's report showed the following general results:

Station earnings.....	\$942,575
Operating expenses for repairs and renewals.....	385,494
Net earnings of stations.....	557,080
Income from other sources.....	20,446
Total.....	\$577,526
Less general expenses and taxes.....	102,389
Net earnings.....	\$475,137

The increase in business since 1889 is:

	Gross.	Net.		
1889.....	\$327,078.99	\$124,031.97		
1890.....	435,595.83	229,076.80		
1891.....	675,505.43	347,228.63		
1892.....	963,121.25	475,137.61		
	1889	1890	1891	1892.
Number of customers.....	1,213	1,698	2,375	4,344
Number of lamps, 16-candle power.....	39,815	64,174	94,485	142,492
Number of motors, horse-power.....	470	697	2,000	3,807
Number of arc lights.....	110	254	841	1,637

Each horse-power motor and each arc light is equal to ten 16 candle-power lamps.

The figures above show that the gross earnings have increased 42 per cent. and the net earnings 36 per cent. over last year, the ratio of the net to the gross being 49 per cent., or about the same as last year. The net earning of the company would have shown even more favorably had there not been delays in obtaining machinery. The extension of the Elm street station to Duane street has been completed. A new station has been commenced on Fifty-third street. Various officers of the company made trips to Europe during the year. The results of the observations are shown in material expenses and developments of the plant. The work of wiring buildings has been turned over to the New York Electric Equipment Company, the Illuminating Company receiving therefor a large block of the former's stock. Plans matured provide for the increase of the capital stock to \$6,500,000, and of the first mortgage convertible bonds in \$2,250,000 to \$3,250,000. The recent decisions concerning the Edison lamp patents are expected to strengthen the company's interests materially.

The electrical situation in New York City is peculiarly favorable to the company. It does approximately 50 per cent. more business than the total of all other companies. The policy of the company is to supply currents at prices which will decrease from time to time as the growth of the demand and supply permits, conditioned upon the relative decrease in operating expenses.

The condensed balance sheet shows the following:

Dr.	
License under Edison patents.....	\$3,020,000.00
Real estate, construction and property, and other investment accounts.....	\$5,119,965.78
11,163 shares Edison Light & Power Installation Company.....	1,116,400.00
683 shares New York Electric Equipment Company.....	68,300.00
Customers' accounts.....	6,304,665.78
Sundry accounts and supplies on hand.....	143,796.40
Cash on hand.....	89,052.51
	33,736.17
Total.....	\$9,591,250.86

Cr.	
Capital stock.....	\$6,500,000.00
Less installment due February 3, 1893.....	400,000.00
	\$6,100,000.00
First mortgage convertible 5 per cent. bonds.....	3,100,000.00
Bills and accounts payable.....	136,837.65
Sundry accounts.....	2,592.11
Dividend No. 31, due February 1, 1893.....	66,567.50
Reserve fund.....	82,355.78
Accrued interest.....	51,666.67
Profit and loss.....	51,291.15
Total.....	\$9,591,250.86

The income account for the year was:

Dr.	
Dividends paid 1892:	
May 1.....	\$57,849.94
August 1.....	57,849.97
November 1.....	62,748.75
Due February 1, 1893.....	66,567.50
	\$245,011.16
Reserve fund.....	50,000.00
Accounts written off.....	7,510.48
Interest on bonds.....	78,832.00
Accrued interest on bonds to December 31, 1892.....	49,899.17
Balance December 31, 1892.....	51,291.15
Total.....	\$481,543.96
Cr.	
Balance December 31, 1891.....	\$61,006.23
Less dividend paid February 1, 1892.....	54,568.88
	\$6,437.35
Net earnings, 1892.....	475,137.61
Total.....	\$481,543.96

### Treasury Decisions.

#### Small Grindstones not Whetstones.

Before the United States General Appraisers at New York, December 22, 1892. In the matter of the protests, 29749 a-14643, of G. W. Sheldon & Co., against the decision of Collector of Customs at New York as to the rate and amount of duties chargeable on certain grindstones, imported per "Magdalene," June 2, 1892. Opinion by Somerville, General Appraiser.

The present tariff act (paragraph 129) levies a duty of \$1.75 per ton on grindstones, finished or unfinished.

Paragraph 608 puts on the free list hones and whetstones.

The merchandise under consideration is claimed to be free of duty under the latter paragraph as whetstones.

We find the facts as follows:

1. The goods are invoiced and entered as 37 casks of whetstones.

2. The sample accompanying the papers is a correct representative of the merchandise, being, in geometric shape, a solid wheel of stone, about 4 inches in diameter and 2½ inches in altitude. It is apparently of sandstone, and contains a hole drilled through the center suitable for the insertion of a small spindle.

3. We find that the article is in fact a grindstone and not a whetstone.

A whetstone is a stone commonly used for sharpening cutlery or tools by friction. The tariff act, in enumerating this article associates it with hones, to which it is analogous in use.

A grindstone is either of the millstone variety or else it consists ordinarily of a solid wheel of stone made to be turned by a handle or other power, and is used for grinding, sharpening or polishing.

This distinction between the two kinds of stones is clear and well marked.

The protest is overruled and the Collector's decision affirmed.

#### Mottled Enameled Ware.

Before the United States General Appraisers at New York, December 23, 1892. In the matter of the protests, 32353 a, &c., of Hermann Aich, against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain mottled enameled ware, imported per vessels and at dates named in schedule annexed. Opinion by Wilkinson, General Appraiser.

The goods are articles of sheet steel enameled. They were returned by the Appraiser as enameled in more than one color,

and assessed for duty at 50 per cent. under paragraph 172, N. T., and are claimed to be dutiable at 45 per cent. under paragraph 171, N. T. The enamel is of a stone or slate color with a mottled or marbled appearance. The enamel is laid on in one color and the mottled appearance is caused by the action of acids and heat.

We find that the merchandise is not enameled or glazed in more than one color, and sustain the claim that it is dutiable at 45 per cent. under paragraph 171, N. T.

### American Turbine Water Wheels.—I.

BY SAMUEL WEBBER, WATERTOWN, N. H.

As I stated in my letter published in *The Iron Age* of December 22, my recollections of turbine building in America date from 1844, when I was learning mechanics in Lowell, but was also very much interested in hydraulics, and visited the wheel pits of the Appleton Mills in company with my old friend, the late Uriah A. Boyden, to see the Fourneyron turbines, which he was then introducing in this country.

The illustrations in *The Iron Age* of December 8, 1892, will answer almost exactly for the wheels placed by Mr. Boyden in 1844, except that his were only single wheels, the only difference being that the gate, which, in Mr. Boyden's wheel and in the first Fourneyron, was a cylindrical tube, sliding up and down between the guide curves and the buckets, has now been transferred to the outside of the buckets and throttles the water after it leaves them, instead of cutting it off before it enters them. The form of bucket and its cycloidal curves, the reversed curve of the interior guides or chutes, the feed of water by a pipe in the interior, and the external delivery are the same.

The extreme evils of throttling the water after it leaves the bucket are partially obviated in the Niagara plan by the introduction of horizontal diaphragms, cutting the bucket apertures into three divisions or tubes, so that after the gate has been opened either one or two-thirds, the uncovered sections will give free passage to the water. This subdivision, however, increases what has always been the most objectionable feature of the Fourneyron turbine—its very small water passages, and their liability to choke with any *débris* in the water, whether leaves or anchor ice, or as at Fall River, with eels. These small apertures were inevitable in the original wheel of Mr. Fourneyron, where the quantity of water was very limited and the head very high, and as the water was all filtered before going to the wheel, they were not objectionable, but have been entirely discarded in American practice of late years, and a higher net result or effect obtained, by the use of more roomy water passages; probably simply from the diminished friction on the sides of the passage.

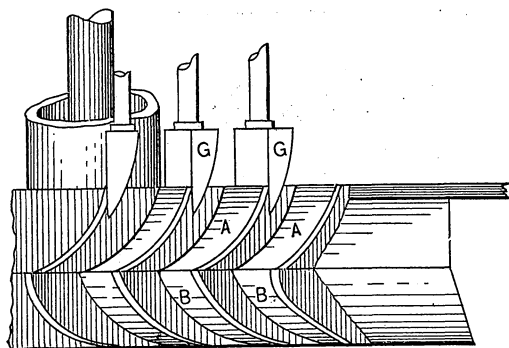
Under Mr. Boyden's direction, the original construction of Mr. Fourneyron was improved in some minor points; automatic machinery was devised for cutting the grooves in the cast-iron crown and base plates of the wheel in which the wrought-iron or bronze buckets, curved to the proper shape, were inserted and riveted, and the wheel, although expensive in construction, became for many years the leading and standard turbine used in all the large manufactories of New England, and is still occasionally built to satisfy the prejudices of that conservative class who believe in no wisdom of later date than their grandfathers.

This form of turbine, commonly known as the outward flow, needs no further illustration than those already published in *The Iron Age*, but another European

type, the downward flow, more frequently called the Jonval, was also introduced in this country at an early date by Elwood Morris of Philadelphia, who published a report on it in 1843.

and India for grinding grain, the upper millstone being fixed on the upper end of the vertical shaft, which was revolved by the action of the water striking the float boards, or paddles, originally simply

once by the centrifugal action of the wheel; then to curve them so as to hold the water more effectually, and finally to introduce a set of guides or chutes, curved in the opposite direction, so as to



A, Guides; B, Buckets; G, Gates.

Fig. 1.—Elevation of Froment-Meurice Turbine.

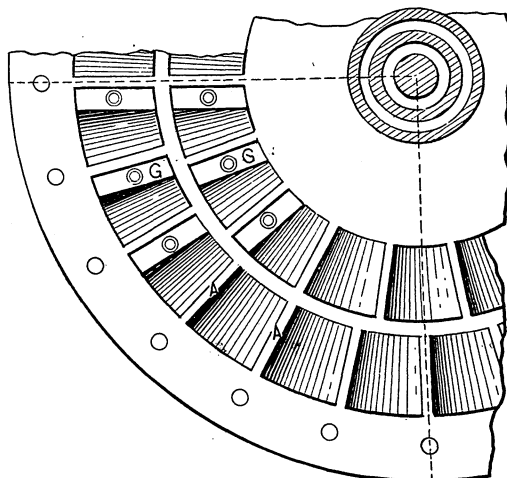


Fig. 2.—Plan of Froment-Meurice Turbine.

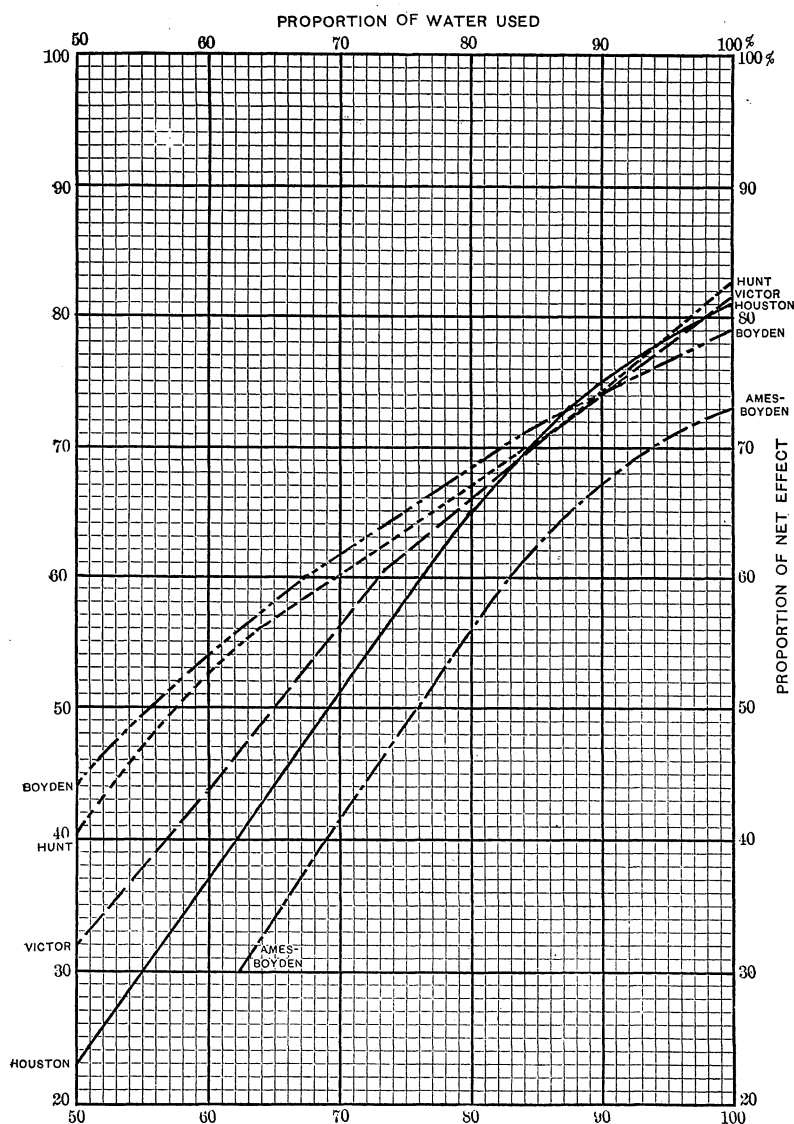


Fig. 3.—Proportion of Power of Water Realized by Wheels where Water Passage is Cut Off by Sharp Edge of Gate.

#### AMERICAN TURBINE WATER WHEELS.

This is probably the original form of turbine, and traces its ancestry directly to the old tub wheel, long used in the mountainous districts of Europe, Syria

mortised into the lower end of the shaft. The next step was to hoop round the outer ends of the floats to strengthen them and keep the water from being thrown out at

lead the water perpendicularly on to the buckets.

To illustrate this type of wheel see the accompanying tracings, Figs. 1 and 2, from "Glynn on Water Power," of a turbine built by Froment, Meurice & Cie., which the writer saw in the Crystal Palace in London in 1851. The gates which controlled the admission of water to this wheel were a series of plungers, which were lifted or lowered between the guides A, as shown by G in the illustration. This wheel was intended for use under a low head and was set directly in the bottom of the flume, so that no feed or discharge tubes are shown. The name of Jonval, often applied to this class of wheel, is from M. Jonval, who set them in tubes or pipes, using draft tubes to carry off the water after passing through the wheel.

The draft tube, however, is of American invention, the writer believes, it having been patented by Lebulon and Austin Parker of Licking, Ohio, in 1840.

Various kinds of gates are used to control the flow of water in these wheels, the most common being what is known as the register gate, from its similarity to the common register used in a hot-air furnace. Mr. Collins of Norwich, Conn., uses a plunger gate, much as shown in the illustrations. The Bodine Jonval has a register gate, and Mr. Geyelin of Philadelphia uses both a register gate and a telescopic gate, applied externally, much as shown in your illustration of December 8. This has been a very popular form of wheel, and is very effective when used at full gate under a low head, but is objectionable under a high head from the great load on the steps, and poor at part gate, as are all wheels where the gate cuts the water off abruptly with a sharp edge. The effect of this cut off is shown in the annexed diagram, Fig. 3, taken from a paper read by the writer some years since before the American Society of Mechanical Engineers, which shows the great loss in net effect with reduced quantities of water from tests made by Mr. Francis and himself with one of the Ames Boyden, from Mr. Emerson's tests at Holyoke. It is only proper to say that since this diagram was made the gates of the Hunt and Victor wheels have been altered so as to show a better result with half water, which in these cases was about one-quarter gate.

If, as appears from the illustrations of December 8, the turbines for Niagara are like the original Fourneyron, it is a very erroneous statement that the pressure of



the water on the under surface of the upper wheel tends to lift it and the shaft and avoid friction, for the water only acts horizontally on the buckets of the wheel, and its whole vertical pressure is expended on the stationary case, which does not allow the water to touch the wheel proper except in a horizontal direction, and the weight of the water consequently has no effect on the load on the bearings in a vertical direction, as it does in the Jouval type of wheel, where the pressure on the step adds the weight of the water to that of the shaft and wheel.

With these remarks I close my notes on turbines of European origin, and in future letters propose to trace the progress of American inventions and the changes they have made in this class of wheels.

### The Edwards Valve Gear.

From *Engineering* of London we take the following description of a small launch engine fitted with a new kind of valve gear, which is the invention of Edmund Edwards of 35 Southampton Buildings, Chancery Lane. In Fig. 2 we give an engraving of the gear, showing the valve face on the cylinders, and the different links of which the gear is constituted. The chief advantages claimed for the arrangement are economy of space and cheapness of manufacture. The gear is applicable to engines with oscillating cylinders. The constant movement is due to the proper lead and cover being given to each valve by the movement of the opposite cylinder, while the movement of variable extent requisite for distributing purposes is obtained by the oscillation of the cylinder to which the valve itself relates. The two cylinders are alike and their piston rods are connected by the same crank pin. The valve is situated between the cylinder and the trunnion through which the steam is admitted, a small space being left between the back of the steam chest and the bearing of the trunnion to allow for movement of the gear when the engines are reversed. Where, as in these engines, the movement of the valve is derived from the oscillation of the cylinder, an uneven action is caused by the lateral movement, and consequent travel of the outer end of the valve spindle, being less at the upper part of its stroke than at the lower part, and in order to remedy this the valve spindle is jointed to a radius link the length of which is less than if its upper center coincided, when in its central position with the center of the trunnion. This method of rectifying the uneven movement above referred to enables the upper end of the controlling link to be moved from side to side under the trunnion for the purpose of reversing the engine or varying the expansion, as in an ordinary link motion.

Referring to the outline drawing, *g g* are the valve spindles, the lower ends of which are pivoted to links *d*, whose upper ends are pivoted to links *e* of similar length, the lower ends of which are in turn pivoted at points coincident with the center lines of the engine to bent levers. The upper ends of these bent levers are pivoted to rods *b*, each operated by the oscillation of the opposite cylinder. The links *e* are also pivoted near their upper ends to links *f*, which connect them to the reversing lever *a*. A constant motion equivalent to the lead and cover of the valve is therefore given to the valve spindles *g g*, while the additional distributing movement is given to the valve by the oscillation of its own cylinder, such movement depending upon the distance of the upper end of the rods *d* and *e* from the center line of the cylinder, which distance can be varied by the reversing lever *a*, the engines being reversed by throwing the upper

ends of the rods *d e* over to the opposite side of the center line. When the reversing lever is in its central position each valve has only the movement due to the oscillation of the opposite cylinder. The lower part of the trunnions between the bearing and the steam chest is cut away, as shown, so as to allow the upper ends of the rods *d e* to pass from side to side.

fully transported through thick ice by vessels equipped with three propellers, one on each quarter and one in the bow. The experiments made have been with oil conduits run out from the pierheads to a distance of 400 yards into the lake. The presence of the oil assures smooth water on which to steer in for the pier entrance. In connection with the oil conduit from

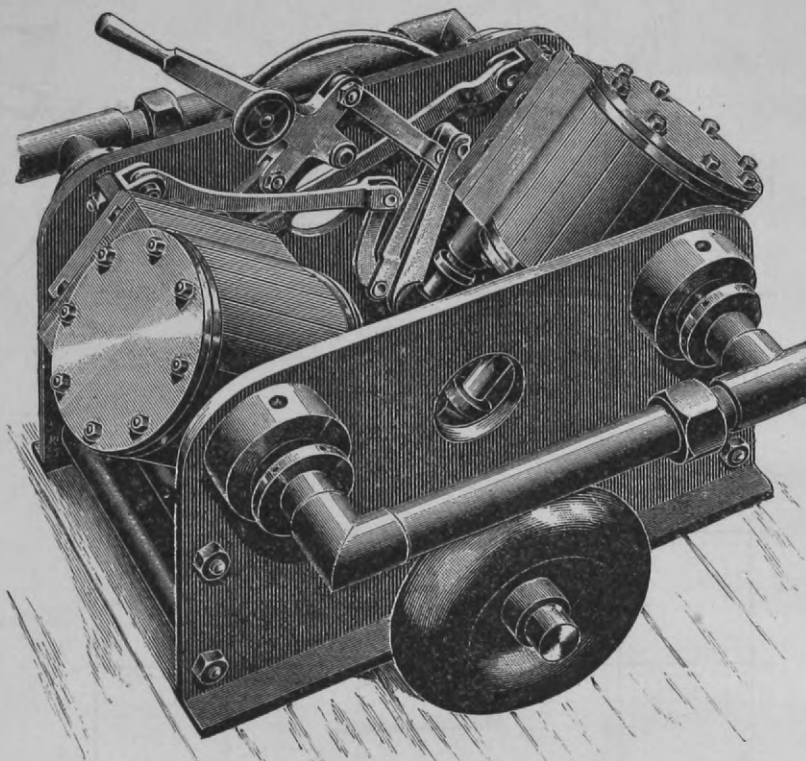


Fig. 1.—Perspective View.

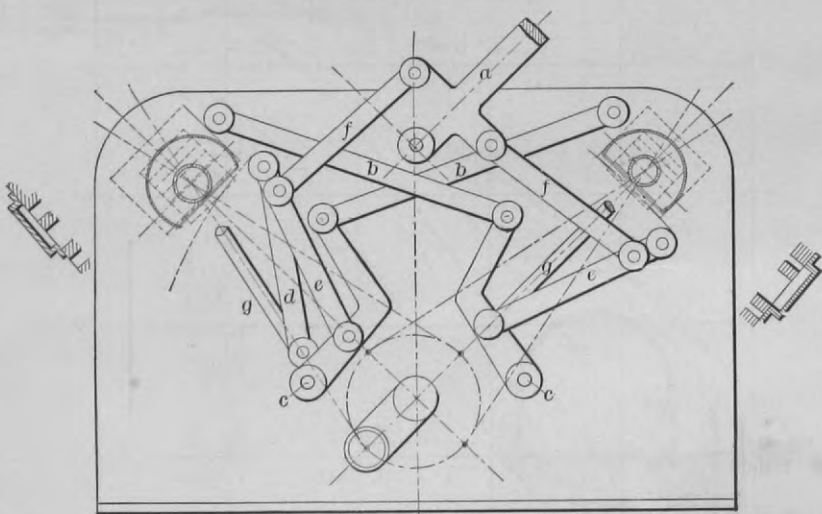


Fig. 2.—Diagram of Valve Gear.

### THE EDWARDS VALVE GEAR.

The action of the valve gear is good and effective, and as it is obtained entirely by means of pivoted bars, it is cheaply made and durable, there being no sliding friction. Mr. Edwards has placed engines of this type in one or two river yachts and launches, positions in which the compactness and smooth running obtained by the use of the gear are especially valuable.

An interesting experiment in the use of oil as an aid to navigation in rough weather is making at Frankfort on Lake Michigan, where railroad cars are success-

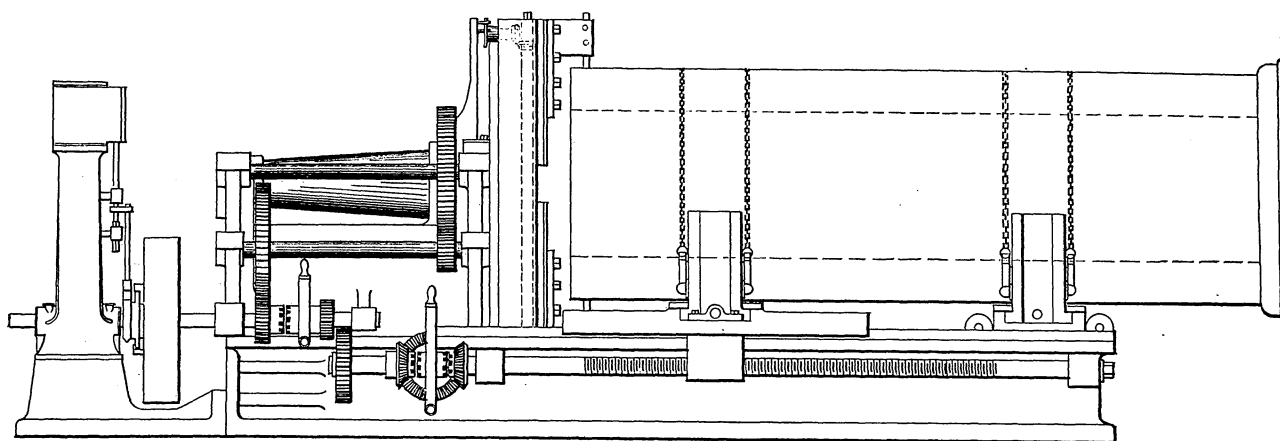
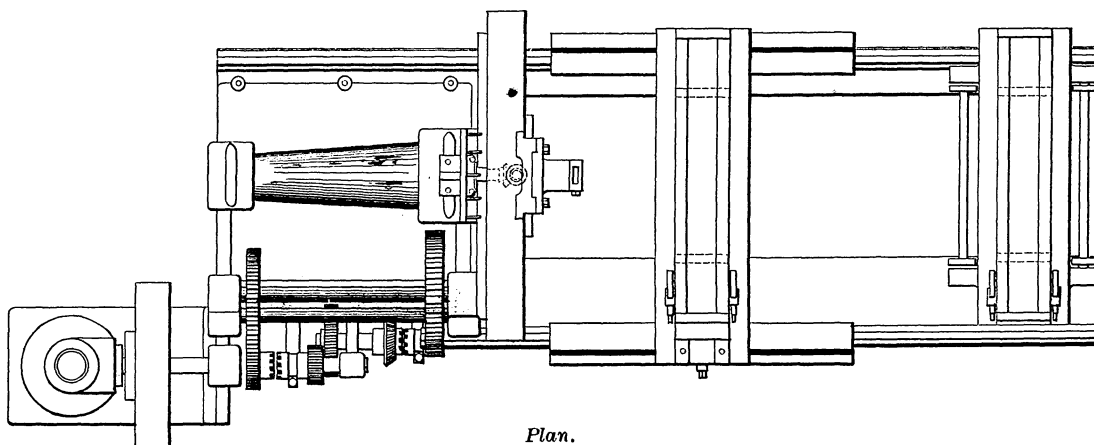
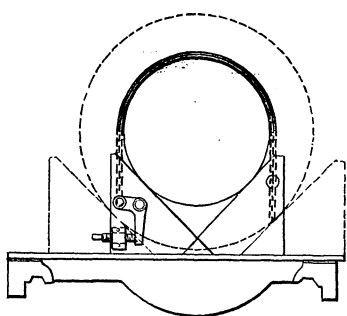
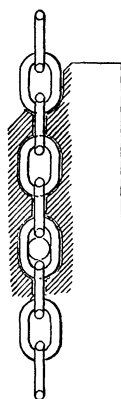
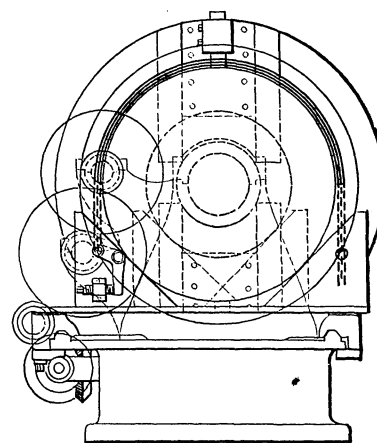
fully transported through thick ice by vessels equipped with three propellers, one on each quarter and one in the bow. The experiments made have been with oil conduits run out from the pierheads to a distance of 400 yards into the lake. The presence of the oil assures smooth water on which to steer in for the pier entrance. In connection with the oil conduit from shore, the two steamers employed will now carry oil bags ready for use whenever entering port in stormy weather. The oil bags are made of canvas, cone shaped, and are about the size of an ordinary 100-pound flour sack. The bags are first filled with waste and then with oil. Finally they are well punctured with a sail needle, and when used are trailed over the weather bow, along the water line, by good stout lines. The oil, oozing out, stretches away for a distance of 50 feet on the weather side of the vessel, and presents a barrier across which no sea can cross.

**Pipe Cutting-Off Lathe.**

We herewith present drawings of a new pipe cutting off lathe built by the Niles Tool Works of Hamilton, Ohio. It is designed for pipe from 30 to 48 inches in diameter. The pipe is held in adjustable rests by which any size pipe within the

control of the machine without moving from his position. The carriage is moved in either direction upon the bed by power, and though the machine is designed for comparatively rough work the regular machine tool standard of workmanship is maintained upon it, all gears being cut from the solid, and the spindles, shafts

have been excluded, while a money qualification of say \$100, the amount commonly suggested, would have shut out by far the larger proportion. Another plan which has been proposed is that of inspection abroad by American consuls. This plan, Commissioner Weber said, is the most expensive in its enforcement and the most

*Side Elevation.**Plan.**Cross Section.**Method of Securing Chain.**Sectional End Elevation.***THE NILES PIPE CUTTING-OFF LATHE.**

capacity of the machine can be properly centered. Slides attached to the face plate carry the cutting tools, there being two of these, which are fed by a "star feed," and can be fed  $\frac{1}{4}$  inch per revolution.

The machine can be arranged to be driven either by belt or by an independent engine, as shown in the engraving, and in either case is so geared as to have ample driving power for the heaviest work. Clutches worked by levers which are conveniently placed give the operator full

and screw made of steel. The machine weighs 35,000 pounds.

Colonel Weber, United States Commissioner of Immigration, while discussing the other night in a public lecture the various plans proposed for restricting immigration, did not attempt to advocate any one of them, but stated that last year if an educational test had been in force in this country one-fifth of the arrivals might

deceptive and barren in its yield. Consular certification must be made either in the consular district where the intending emigrant lives or at the seaport where he embarks. At neither place has the consul personal acquaintance with the subject. He must believe the emigrant or the local authorities.

The Creusot Collieries, Forges, Steel-works and Mechanical Construction Workshops Company have just issued their report

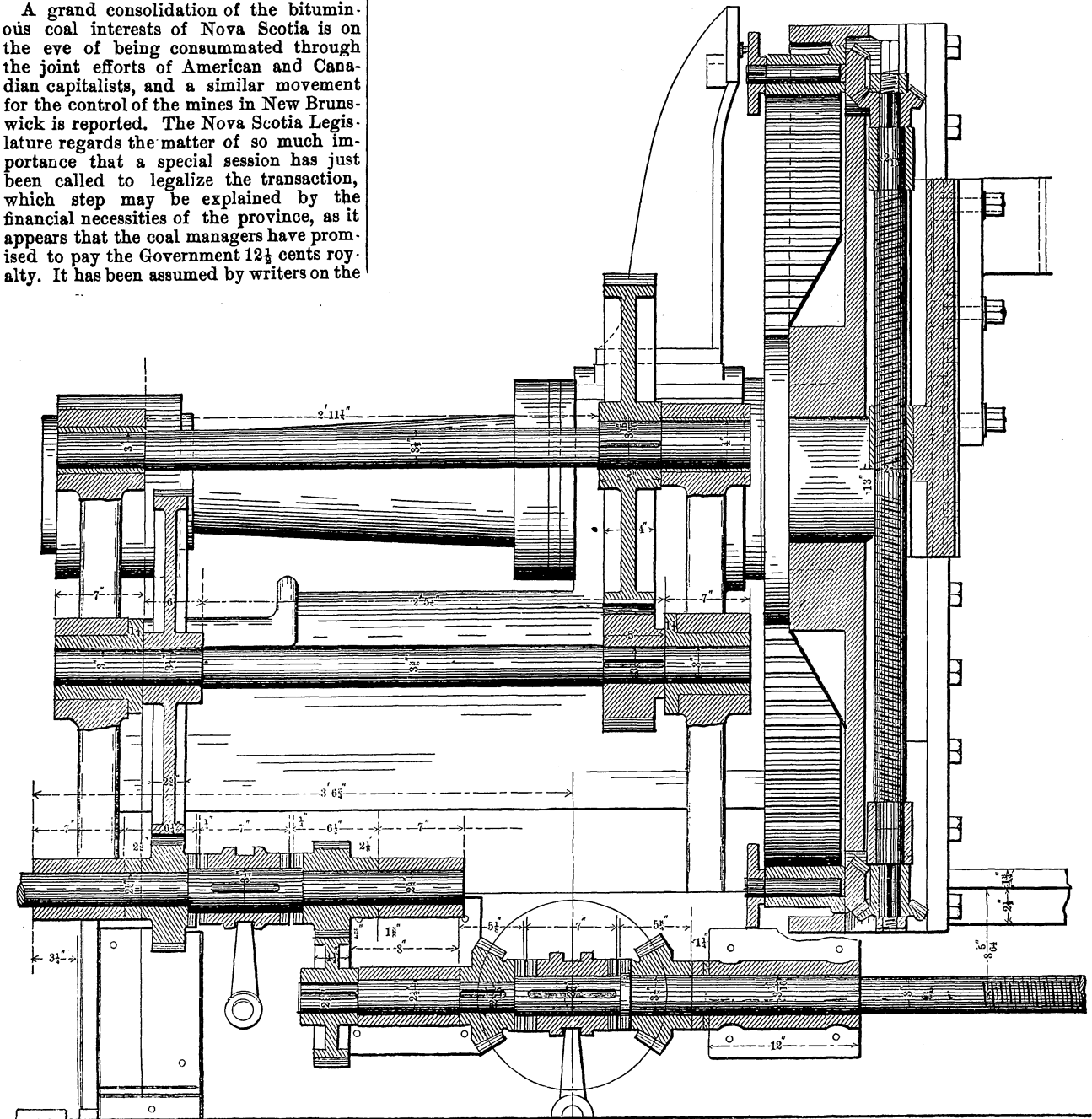
for 1891-92. The profits of the past financial year are returned at \$1,621,937. The dividend for the year has been fixed at \$19.40 per share, payable half December 15, and half June 15. The ordinary and special reserves are returned at \$2,805,802.60.

#### The Nova Scotia Coal Fields.

A grand consolidation of the bituminous coal interests of Nova Scotia is on the eve of being consummated through the joint efforts of American and Canadian capitalists, and a similar movement for the control of the mines in New Brunswick is reported. The Nova Scotia Legislature regards the matter of so much importance that a special session has just been called to legalize the transaction, which step may be explained by the financial necessities of the province, as it appears that the coal managers have promised to pay the Government  $12\frac{1}{2}$  cents royalty. It has been assumed by writers on the

third and one-half of this finds its way to Quebec and Montreal. The New Brunswick Company claim to have located two seams, one of 6 feet and the other of 10 feet, of pure anthracite coal. Attempts to work this coal field have been made off and on for many years, but, owing to the want of capital, with little success. Of course Boston and the Eastern

ties, as well as the indirect cause of the exports of gold. The addition to the currency from the source mentioned already exceeds \$125,000,000. A superabundance of currency and high prices naturally go together with the inevitable reaction which such conditions invite. At first the Western States absorbed the surplus, but now the current turns toward the financial



Section through Head Stock.

#### THE NILES PIPE CUTTING-OFF LATHE.

subject that the United States citizens concerned are calculating with confidence that Congress will soon put coal on the free list, thus opening the way for remunerative speculation. Canadians generally, especially in the larger cities, are taking a deep interest in the subject, as they obtain the bulk of their coal supplies from Nova Scotia and are apprehensive of a "corner" prejudicial to their interests. The proposed combination, it is said, will be in a position to compel any independent company not included in the arrangement to co-operate in its policy. There has been a large development of the coal trade of Nova Scotia during the last 14 years. The sales in 1878 were 888,000 tons; last year they were 1,761,000 tons. Between one-

States watch events now transpiring with interest, as manufacturers in that region naturally entertain the hope of a trade with Nova Scotia that may prove highly advantageous, not only with reference to imports, but as opening a profitable market. For example, the Dominion might find it difficult to compete in supplying the Bluenoses with flour, and a more liberal interchange of products would be likely in course of time to bring all the maritime provinces into closer commercial connection.

The inflation of the currency through the operation of the Sherman act is supposed to be responsible for the renewed spirit of speculation in all sorts of securi-

ties, where an accumulation is taking place.

There were built on the Pacific Coast last year 79 vessels, principally schooners and small steamers. Puget Sound leads in this branch of industry.

In the struggle of rival corporations to gain control in the coal regions, the Pennsylvania Railroad has lately gained several points. By getting possession of a short line of railroad near Pittsburgh the Pennsylvania taps valuable bituminous coal regions, and Cox & Brothers, entire traffic, comprising at least 3,000,000 tons, will hereafter be transferred to the same route.

## Iron and Steel Industries of the Southern States.\*

BY DR WILLIAM M. SWEET.

One of the most notable features of the growth of the iron and steel industries of the United States during the past decade is the activity displayed by the Southern States in the erection of iron making plants, particularly large coke blast furnaces. In direct connection with this work there has been an advance almost equally great in the development of the extensive mineral resources necessary to the operation of these iron-making establishments. Steel making, although not wholly neglected, has not formed a prominent feature of this metallurgical development.

The progress made by the Southern States in the manufacture of iron and steel during the past 20 years is shown in Table 1, the statistics being for the census years 1890, 1880 and 1870. In compiling the figures of this table the geographical division of the Southern States is considered as comprising the iron-making States of Alabama, Delaware, Georgia, Kentucky, Maryland, North Carolina, Tennessee, Texas, Virginia and West Virginia. These statistics include only the operations of blast furnaces, iron and steel rolling mills, Bessemer, open-hearth and crucible steel works, iron ore forges and pig and scrap iron bloomeries.

Table 1.—Comparative Statement, 1890, 1880 and 1870.—Iron and Steel Works.

General heads.	1890.	1880.	1870.
Number of establishments..	145	+218	175
Capital invested..	\$50,845,066	\$29,145,830	\$13,372,085
Average number of hands employed..	*18,688	20,595	11,159
Amount of wages paid....	*\$7,628,343	\$6,261,344	\$4,846,159
Cost of materials used .....	28,580,796	14,953,674	11,375,953
Value of products .....	42,590,822	25,353,251	21,472,665

\* Excludes officers or firm members, clerks or salesmen and their salaries.  
+ Includes one establishment in the District of Columbia.

The decrease in the number of establishments in 1890, as compared with 1880, is due to the fact that a large number of charcoal furnaces of small size and unfavorably situated for securing cheap materials and distribution of their product have been abandoned during the past decade, while many of the furnaces, operated in 1880 by separate firms or companies, or built in succeeding years by distinct organizations, have since been consolidated under one management and appear in the tabulations for 1890 as single establishments. The totals for capital invested, hands employed and wages paid in 1880 and 1890 do not accurately show the growth of the industry in the ten years intervening, owing to the different methods pursued in compiling the data for the two census periods. The totals for 1880 included not only the capital invested, hands employed and wages paid at the iron and steel works of Southern States, but also the same items for ore mining, coal mining, coke burning and other similar branches of industry operated in direct connection with these works. The totals for 1890, relating to the latter branches of industry, dependent on the manufacture of iron and steel, are covered by other census inquiries, and are therefore not embraced in this report.

It is proper to add, in this connection, that with the economy secured by modern machinery and better furnace and mill practice the selling price of the products of iron and steel establishments has been

\* From the Census Bulletin No. 347.

greatly reduced during the past decade; consequently the total value of finished products, as shown in the foregoing table, does not exhibit the increase in the iron industry of the South so graphically as will the quantities of actual production.

**Blast Furnaces.**—It is in the manufacture of pig iron that the progress and activity of the iron industry of the Southern States has been particularly marked during the decade from 1880 to 1890. This section has been long noted for the excellent character of the charcoal pig iron produced within its borders, but prior to 1880 attention was not especially directed to its extensive and easily worked deposits of iron ore, nor to the advantages which the close proximity of coking coal and limestone to these deposits afforded as a producer of coke pig iron at low cost. During 1880 the south produced a little over 9 per cent. of the aggregate pig iron yield of the United States, but in 1890 the Southern furnaces contributed over 19 per cent. of the total output of the United States in that year, the increase over 1880 from this section being 423.52 per cent.

The growth of the blast furnace industry in the Southern States is indicated by the following table, which presents the totals for capital invested, labor and wages, cost of materials and value of products for 1890, 1880 and 1870:

Table 5.—Comparative Statement, 1890, 1880 and 1870.—Blast Furnaces.

General heads.	1890.	1880.	1870.
Number of establishments..	92	121	91
Capital invested..	\$33,207,370	\$6,964,207	\$7,897,325
Average number of hands employed .....	*7,932	9,486	5,488
Amount of wages paid....	*\$2,917,158	\$2,186,855	\$1,668,160
Cost of materials used .....	15,410,982	4,452,864	3,592,955
Value of products .....	22,494,870	7,769,050	7,008,137

\* Excludes officers or firm members, clerks or salesmen and their salaries.

As the data for 1880 represent not only the operation of blast furnaces but also the capital invested, hands employed and wages paid in other branches of industry operated in direct connection with these works, a more accurate comparison of the growth in capital invested during the decade of 1880 to 1890 is shown in the following table, in which the figures of plant and equipment for 1880 more nearly represent the direct investment in the blast-furnace industry:

Table 6.—Items of Increase and Decrease in Invested Capital, 1890 and 1880.

Classification.	Invested capital.		Percentage of increase or decrease.	
	1890.	1880.	Increase.	Decrease.
Buildings, machinery, tools, &c.....	\$22,592,812	\$6,016,941	275.49	.....
Land.....	2,724,549	10,947,266	.....	3.04
Cash and stock on hand .....	7,890,009	.....	.....	.....
Totals. ....	\$33,207,370	\$16,964,207	95.75	.....

The increase in the total capital invested in blast furnaces is 95.75 per cent., while the investment in buildings and machinery has increased 275.49 per cent. There is a decrease of 3.04 per cent. in the remaining items, the causes of this apparent decline having been previously explained.

**Rolling Mills and Steel Works.**—In 1880 44 iron rolling mills, 2 open hearth steel works and 2 crucible steel works were situated in the Southern States. In 1890 there were 41 iron and steel rolling mills not connected with steel producing works; 7 establishments with Bessemer and open-hearth steel plants, 5 of which works contained trains of rolls for the production of

rolled iron and steel; and 2 crucible steel works, only 1 of which contained trains of rolls. The growth of the manufacture of rolled iron and steel in the South during the years 1890, 1880 and 1870 is shown in the following comparative table, the figures including the operations of iron and steel rolling mills and Bessemer, open-hearth and crucible steel works:

Table 10.—Comparative Statement, 1890, 1880 and 1870. Rolling Mills and Steel Works.

General heads.	1890.	1880.	1870.
Number of establishments..	49	48	71
Capital invested..	\$17,528,096	\$11,665,260	\$5,104,510
Average number of hands employed.....	*10,696	10,615	5,425
Amount of wages paid .....	*\$4,677,185	\$3,964,612	\$3,100,000
Cost of materials used .....	13,036,029	10,252,098	7,602,346
Value of products .....	19,920,952	17,062,587	14,108,071

\* Excludes officers or firm members, clerks or salesmen and their salaries.

In the decade from 1880 to 1890 14 iron and steel establishments have been built in this section, and during the same period 12 were abandoned for iron making purposes, showing a net increase of 2 establishments in ten years. The apparent discrepancy in the number of establishments given is due to the different methods pursued in tabulating the figures for the two periods. In 1880, where a rolling mill was operated in connection with a steel plant, the works were tabulated as two separate and distinct establishments. In 1890, owing to the impossibility of accurately separating the capital invested, labor and wages, and materials and products of establishments producing both iron and steel, a plant comprising both a rolling mill and steel works has been counted as a single establishment.

The Southern States have made but little progress in the production of steel since 1880, the character of the iron ores of this section being generally unsuitable for use in the older and well-tried processes of steel manufacture. During 1890 steel was produced experimentally by the basic process at an open-hearth plant in Alabama, and since the close of the census year an establishment in Chattanooga has engaged in the manufacture of steel by the same method. Since 1880 five Bessemer steel plants have been erected in the South, four of which were added to existing iron rolling mills. Of this number one is in Vir-

ginia, two in West Virginia and two in Tennessee. At the close of 1890 large steel works were in course of erection at Sparrow's Point, Baltimore, Md., for the manufacture of steel by the Bessemer process. This plant has since been completed and put in operation.

In 1880 the South was credited with two open-hearth and two crucible steel works, but in 1890 the open-hearth steel plants had increased to three, the number of crucible steel works remaining unchanged.

Of the 49 rolling mills and 3 steel works reported in 1890, seven were idle during the entire year. In the preceding table the total of capital invested includes the



investment in these idle works, and also the amount actually expended on five establishments building at the close of that year. The capital invested in these various works is classified in the following table:

Table 11.—Distribution of Capital Invested in Active and Idle Plants and those in Course of Construction, 1890 :

Classification.	Aggregate.	Works in operation.	Works idle.	Works building at close of census of year.
Land.....	\$2,200,923	\$1,797,723	\$112,500	\$290,700
Buildings..	2,551,387	2,185,591	237,993	127,800
Machinery.	6,938,989	5,977,832	606,557	555,500
Cash and stock on hand.....	5,936,897	5,936,897	.....	.....
Totals...	\$17,528,096	\$15,598,016	\$956,050	\$974,000

Of the aggregate capital invested in rolling mills and steel works in 1880 \$7,051,700 was credited to buildings and machinery, and the remaining \$4,613,560 to land and cash capital. In the ten years under consideration the increase in aggregate capital was 50.26 per cent., while the value of buildings and machinery had increased 33.16 per cent. and the investment in land and cash capital 76.39 per cent.

**Forges and Bloomeries.**—In 1880 the Southern States contained 49 establishments engaged in the production of pig and scrap blooms and blooms and bar iron direct from the ore. Most of these works produced bar iron, and were located in the mountainous districts of Eastern Tennessee and Western North Carolina. They were operated only at irregular intervals, depending upon the wants of the neighboring blacksmiths and also upon the supply of water in the mountain streams, which furnished the power for both the trompes (or water blasts) and the hammer. The aggregate annual production of the works was therefore small. With the development of the rolling-mill industry in the South and the extension of transportation facilities these primitive iron-making establishments have one by one been abandoned, so that at the present time the manufacture of bar iron direct from the ore by the old-fashioned Catalan process is practically an extinct industry in the Southern States. There is a possibility, however, that one or two of these works may again make a small quantity of iron.

The four establishments reporting in 1890 were equipped for the production of blooms from pig and scrap iron, two of these works being located in Maryland, one in Virginia and one in Alabama. The manufacture of blooms from pig and scrap iron is also declining in the South.

The following table is a comparative statement showing the condition of iron ore forges and pig and scrap iron bloomeries in 1890, 1880 and 1870:

Table 15.—Comparative Statement, 1890, 1880 and 1870.—Forges and Bloomeries.

General heads.	1890.	1880.	1870.
Number of establishments.....	4	49	13
Capital invested.....	\$110,200	\$516,363	\$370,250
Average number of hands employed.	*60	494	246
Wages paid.....	*\$34,000	\$108,877	\$77,990
Cost of materials used.....	133,785	248,712	210,652
Value of products	175,000	521,614	350,457

\* Excludes officers or firm members, clerks or salesmen and their salaries.

In 1880 the forges and bloomeries of the South produced 1355 tons of bar iron di-

rect from the ore valued at \$104,016; 7038 tons of blooms from pig and scrap iron, valued at \$414,460, and other products valued at \$3138. The establishments in 1890 produced 5320 tons of pig and scrap blooms, valued at \$175,000, in the manufacture of which there were consumed 4645 tons of pig iron, costing \$73,289; 1540 tons of old or scrap iron, costing \$28,610, and coke, charcoal and other materials, costing \$31,886.

## THE WEEK.

The designs for two bridges to be built across the East River by the East River Bridge Company were approved by the Secretary of War with this single modification, that the height of the lower span of the roadway shall be raised at its center 140 feet above mean low water, which is 5 feet higher than that of the bridge now existing. The Maritime Exchange and some of the pilots advocated 150 to 160 feet as the necessary height, and the Secretary of War accepted a compromise. At least half a dozen ships have lost their topmasts while going under the East River Bridge, and for this reason warehouse property is more valuable if situated below the structure.

The amenities of seafaring life are exemplified in the case of the steamship "Huron," whose owners accepted \$60,000 for towing the disabled steam ship "Spree" into port instead of double that amount, the sum demanded before going into court. Usually it is a question whether to abandon the property or to accept assistance on the terms offered.

A combination against the Sailors' Union, on the Pacific Coast, threatens to result in a general tie up.

An experimental effort is making to establish a coke trade between Baltimore and Mexico, and the first cargo will soon be dispatched.

The imports of rubber into the United States in 1892 amounted to 34,300,000 pounds, principally from Brazil. This is a decline compared with the previous year.

In at least two instances the compasses of steamships arriving at this port recently have been rendered useless by the freezing of the alcohol.

Governor Flower has appointed Thomas J. Dowling Commissioner of the Bureau of Labor Statistics in place of Charles F. Peck. Mr. Dowling was formerly President of the State Workingmen's Assembly. He is a blacksmith by trade, and at one time lived in Brooklyn. He has since lived in Albany.

Some of the residents at Homestead talk of persuading Carnegie to "let up" on the proceedings against alleged rioters and conspirators, as though he could condone offenses against the State. Do they comprehend the gravity of the charges that they must refute?

Cutting off the supply of labor by restricting immigration is liable to embarrass Western farmers, both in planting and gathering their crops. Last autumn heavy losses of grain were reported from the impossibility of obtaining men to do the work. One effect is likely to be a more urgent demand for agricultural machinery.

British foreign trade for December again shows a shrinkage equal to 12.4 per cent. in imports and 2.6 per cent. in exports.

The total receipts of the New York Post Office last year were \$7,059,000, and the net revenue nearly \$4,500,000.

The injury done by destroying the forests is not in lessening the total rainfall, but in producing the unequal flow of the

streams. The trees, by preventing rapid evaporation, keep the falling snow and the moisture from heavy rains under their shadow for a much longer period, so that instead of heavy freshets, soon followed by drought, there would be, if the forests were standing, a steadier supply of flowing water.

The Columbia River and Alaska canners talk of combining to prevent an overstock of salmon.

The new wing of the Natural History Museum in Central Park will cost \$300,000.

Brooklyn has appropriated \$685,000 for water works enlargement.

The New York State Agricultural Society reports that farmers have had a prosperous year.

Judge Nelson of the United States Court decides that the Chinese exclusion law is unconstitutional. The Judge is not alone in this opinion.

Four railroad concessions in Mexico have been withdrawn for non-compliance with the terms of the contract, the deposits in each case being forfeited.

The submarine cable on the west coast between Mexico and Peru is to be duplicated.

American travelers returning from Honduras report that a large number of Americans are in that Republic and that the capital is almost an American city.

The Hawaiian Kingdom seeks closer relations with the United States, and the Legislature proposes a royal commission who shall proceed to Washington to obtain information as to terms upon which more satisfactory relations can be established between the two countries.

Harrison Loring of South Boston offers to build steel sailing ships of 2300 to 3300 tons register for \$60 per ton, gross tonnage.

The enforced idleness of workmen in the building trades during the last two weeks of cold weather, together with the loss of trade sustained by dealers in materials, means that the "snap" has cost a great deal of money.

California is expecting a large increase of business in consequence of low rates of freight by rail, as well as by clipper and steam ships.

In reference to railroad pooling, which railroad managers earnestly desire to sanction, when an amendment of the Interstate Commerce law to this effect was proposed in Congress last week, a negative was encountered in the House.

The Ohio railroad combines begin to receive the attention of the State Legislature.

For \$100,000 J. M. Shenk and Thomas Evans purchased a controlling interest in the Lebanon Iron Works.

Every trade engaged in the building line in Chicago will make a demand for increased pay April 1. In addition to the demand for an increase in wages, all the unions will insist on an agreement with the contractors to employ only union men in their respective lines of work being made.

A citizen of Tokio, Japan, now in this country, says that beginning about May 1 the Pacific steamships will have all they can do for several months transporting passengers from Eastern countries who are preparing to visit the United States.

Eiffel's plan for a great bridge across the River Neva at St. Petersburg has just been accepted, and the St. Petersburg municipality has voted the 26,000,000 rubles required to build it.



# The Iron Age

York, Thursday, January 26, 1893.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

The Index of *The Iron Age*, Volume I, July-December, 1892, is now ready, and may be obtained on application to David Williams, publisher, 96-102 Reade street, New York; or to 220 South Fourth street, Philadelphia; Room 509, Hamilton Building, Pittsburgh; 59 Dearborn street, Chicago; Fourth and Main streets, Cincinnati; Bank of Commerce Building, St Louis; 146 Franklin street, Boston, and 219 Superior street, Cleveland.

## The Southern Iron Industry.

A census bulletin has just been issued which deals with the iron and steel industries of the Southern States. The statistical work has been carried through by Dr. William M. Sweet, long associated with James M. Swank. The figures will be accepted by the trade with all the confidence which Dr. Sweet's thorough knowledge of the industry and his conscientious care entitle them to. We must, however, deplore the fact that Dr. Sweet has adhered to a geographical grouping which is unnatural, so far as the iron trade is concerned, and jumbles together sections of the country whose industry is based upon conditions differing so utterly. We believe that no one in the iron trade ever thinks of the Wheeling district as constituting a part of the South, so far as the iron industry is concerned. The Wheeling district is as much a part and parcel of the Northern section as is the Mahoning or the Shenango Valley or the Pittsburgh district. It draws upon the same sources for its raw material, using lake ores and Connellsville coke chiefly. It makes largely the same products, seeks the same markets and follows the same methods. There is something bordering on the absurd to cut the district in two, assigning the works which happen to be on one side of the river to the South, while plants on the Ohio bank in sight of the Wheeling mills proper are classified as Northern industries.

We note, also, that Delaware is classified as a Southern State, and that its rolling mills are thus violently wrenched from their proper group. We question whether it has ever occurred to any one to call the Wilmington mills Southern industries, while the works along the Delaware River between Chester and Philadelphia wander into the Northern column.

We question even whether it is just to classify the Maryland iron works among the Southern industries. The Sparrow's Point works, for instance, have no affil-

ations with that section of the country, so far as the supply of raw materials, nature of plant and character of product are concerned.

The principal objection to a classification like that adopted by the Census Office is that it renders more difficult the study of the resources and of the position of the principal districts of the country. A rise or decline of the plants on the West Virginia bank of the Ohio River might modify the aggregates for the Southern States, as grouped by the census, to such an extent as to obscure the movement in the development of the resources of Alabama, Tennessee and Virginia.

An incidental objection to the method pursued is that it encourages those who prostitute statistical science for the sake of furnishing material for the Southern boomer. The wonderful feats of some of the newspapers in the way of piling up figures have long ceased to make any impression upon careful business men. They serve only to make the authors ridiculous. The more thoughtful and progressive Southern men have reached the point when they regard these childish extravagant "statistics" as hurtful. They will not regard with approval the classification adopted by the Census Office.

Dr. Sweet's compilation shows that the products of Southern iron and steel works increased in value from \$25,353,251 in 1880 to \$42,590,822 in 1890, or \$17,237,571 in ten years. Taking out Delaware and West Virginia, we make the increase from \$16,951,942 in 1880 to \$29,425,287 in 1890, or \$12,473,345.

The objections raised apply, of course, particularly to the figures referring to the rolling mills. As given in the census report, the totals are as follows:

	1890.	1880.
Number of establishments.....	49	48
Capital invested.....	\$17,528,096	\$11,665,260
Average number of hands employed.....	10,696	10,615
Wages paid.....	\$4,677,185	\$3,964,612
Cost of materials.....	13,036,029	10,252,098
Value of products.....	19,920,952	17,062,587

Taking out West Virginia and Delaware we have the following figures, which, in our opinion, more accurately express the magnitude of what is known as the Southern rolling mill industry:

	1890.	1880.
Number of establishments.....	32	31
Capital invested.....	\$9,554,552	\$7,843,600
Number employed.....	5,713	6,520
Wages paid.....	\$2,359,438	\$2,318,478
Cost of materials.....	7,669,224	13,522,523

This presentation places the Southern iron industry in its true light. There has been an enormous increase in the tonnage of pig iron produced, while the quantity of the rolling mill products has probably declined. Unfortunately, the original report does not give the quantities of the products of the different States, so that the tonnage cannot be followed. We venture to say, however, that the greater part of the increase in the product from 290,324 net tons in 1880 to 515,775 tons in 1890 would disappear if the figures could be analyzed.

A pretty close estimate may be obtained by taking Mr. Swank's figures for the calendar year 1890, and comparing them with

his census figures for 1880. We reach the following:

States.....	1880. Net tons.	1890.† Net tons.
Alabama.....	650	42,691
Virginia.....	35,176	57,724
Tennessee.....	28,126	22,067
Georgia.....	11,501	1,500
Kentucky.....	65,568	*25,000
Maryland.....	47,609	15,409
District of Columbia.....	284	
Totals.....	188,894	154,391

\* Estimated.

† Exclusive of rolled steel, reported in the total with Delaware.

The figures for 1890 are somewhat difficult to present, because the report of the American Iron and Steel Association puts West Virginia and Kentucky into one group and Maryland and Delaware into another. Enough is clearly shown in the table presented to indicate that the Southern rolling industry has actually declined, so far as tonnage is concerned.

The Southern iron trade does not need boosting, nor we do not believe that Dr. Sweet has at all intended to undertake that labor. The iron trade should, however, thoroughly understand that the grouping accepted by him does not conform to the general understanding of what constitutes the Southern iron districts.

## The Welsh Tin Platers.

Reports are current of labor difficulties in tin-plate factories in which newly-arrived Welsh workmen are employed. In some cases it is known that such radical differences arose between the management and their Welsh employees that all of the latter were discharged and their places filled with men of other nationalities, who were expected to prove more reasonable and less under the control of hide-bound prejudices against the use of labor-saving devices. We know of one instance in which a very progressive and energetic manufacturer found himself so hampered by continual opposition to his wishes and steadfast adherence to ancient customs transferred to his factory from Wales, that he has put himself on record against the employment of another Welshman in his establishment. The experience of this gentleman was that every step taken by him was regarded with suspicion. His whole force was arrayed against him, and the merest alteration in the arrangement of any portion of the factory was at once the subject of the most earnest consultation, and if its object was not thoroughly explained and then perfectly comprehended by the workmen, they dropped their tools and walked out.

From the knowledge of such occurrences as these arises the temptation to generalize, and to conclude that because such things have happened, therefore Welsh workmen are wholly unreliable. We are happy to say this is not the case. There are other tin-plate factories in which but slight difficulty has ever arisen between the management and their Welsh workmen, and the latter have proved to be quick to adapt themselves to new conditions, very reasonable in their view of the adoption of new processes and labor-saving machinery and willing to assist their em-

ployers in establishing the new industry on a plane advanced above that established in Wales. We hear of very good results in notable instances in which newly arrived Welshmen have been employed, and in these cases manufacturers deem themselves fortunately situated in being able to secure skilled workmen of long experience to enable them to turn out tin plates of immediately acknowledged superiority.

In this country, with its mixed nationalities, it is a very easy matter to excite prejudice against a particular race. Ideas of such a character are imbibed unconsciously by persons who pride themselves on their judicial fairness. There is too great a tendency to permit the conduct or disposition of a few representatives of a race to determine how it is to be regarded as a whole. In the matter of the Welsh tin plate workers, the narrow-mindedness of individual workmen causes their fellow-countrymen to suffer. The fact is overlooked that Welsh workmen are not new to this country. Immigrants from Wales were among the earliest settlers here, and they and their posterity have contributed much to the glorious record of America in industrial as well as commercial, financial, military and intellectual achievements. Their influence has been felt particularly in the iron and coal trades. There are honored Welsh names in the list of those who have become prominent as captains of industry and leaders of mechanical progress. Men who bear such names as Thomas, Williams, Jones, Morgan, Richards, Davis, Evans, Roberts, Hopkins, &c., are of Welsh extraction. Those who bear them lie under no ban, but can point to the history of the American iron and coal trades, with which their family histories or personal histories are interwoven. At this late day a few obstreperous and wrong-headed men among the many tin-plate workers who have come over here can hardly bring more than slight discredit on a people known and honored among us from the earliest settlements.

### Forgetting How to Use Iron.

An interesting statement is made by Joseph T. Ryerson & Son, the well-known Chicago plate merchants, with regard to flange iron. They say that occasionally they receive an order for flange or fire-box iron, and quite as often the report comes back: "It's no good." The question is frequently asked: "Why can't you send the kind you furnished us years ago?" In all probability, however, the condemned plate is not a recent effort by some careless maker, but is a first-rate article which has laid in the warehouse for ten years awaiting some customer with a preference for iron. Messrs. Ryerson & Son say, therefore, that the trouble now found with flange iron is, not that the iron is poorer than it used to be, but that consumers have grown accustomed to working steel, and have hardly realized the fact that even the cheapest steel plate as now made works better than iron. To such an extent has the trade forgotten how to

flange iron that the firm, in their monthly circular called *The Boiler Maker*, advise their readers to remember "when ordering iron plate that it cannot be worked against the grain, can only be flanged at a high heat and with greatest care."

Jones & Laughlins of Chicago make almost the same sort of a statement with regard to bar iron. They say that years ago when only making iron they very rarely had a complaint against their special brands of bar iron. All consumers knew how to work it. Now, however, the use of soft bar steel has become so common and it turns out so satisfactory under all sorts of treatment that consumers forget the peculiarities of iron. They sometimes have occasion to again order iron, receive precisely the same qualities they once deemed thoroughly satisfactory and then complain that it is by no means as good as it used to be. Their experience with soft steel has merely led them to expect too much of iron. It seems almost ludicrous to think that the time is at hand when makers and sellers of iron are obliged to educate their customers how to use it so as to get best results!

### Against the Interchangeable Ticket.

Opposition has developed from an unexpected source to the scheme of a 5000-mile interchangeable railroad ticket. This has been a pet idea with the associations of traveling salesmen in the West. They have urged railroad companies to adopt such a ticket for the greater convenience of the traveling fraternity, and have worked up a tremendous volume of public sentiment on the subject, adding immense petitions to cogent and persuasive arguments such as traveling men know so well how to employ. So thoroughly had this work been done that success seemed almost within their grasp, favorable action being expected by the Western Passenger Association at the meeting in Chicago in March.

It was, of course, taken for granted that the employers of the traveling men were in favor of a movement which promised to save them some outlay for the traveling expenses of their representatives. But here is where the unexpected happens. The Minneapolis Jobbers' Association step in with the following communication to the Western Passenger Association:

In regard to the proposed 5000-mile interchangeable mileage ticket, to be considered by your association at its next regular meeting, our association has authorized me to state that we are emphatically opposed to the adoption of this ticket; and, in addition, will state that expressions on this subject from associations whose members employ and pay large sums of money to commercial travelers for railroad fare, &c., should have more weight before your body than the wishes of commercial travelers whose tickets cost them nothing.

This is a very severe blow to the project, and is quite likely to offset the very hard work done by the traveling salesmen in winning railroad managers to their way of thinking. If the men who pay for the traveling see no advantage to themselves in an interchangeable ticket, but are willing to continue to pay on the old basis,

their representatives lose the strongest argument they have in support of the change they advocate. It will be observed that no reason is advanced for this opposition. It would be interesting to know what the reasons are for such apparently heroic self-denial on the part of the jobbers, who do not ordinarily object to anything which promises economy in expenditures.

## CORRESPONDENCE.

### The Price of Mesaba Ore.

To the Editor: In a late issue of *The Iron Age* a statement is made that the West Duluth Furnace had made a contract for Mesaba ores to be delivered at the furnace for \$2 per ton.

As our company is one of the parties who furnish the larger portion of this ore to this furnace, I beg leave to correct the statement, and say that the price is \$2 per ton at the mine, f.o.b.

The report has done the Mesaba mines great injury, and you will confer a favor upon us and upon all parties interested in the Mesaba Range by correcting the same in your next issue.

Yours truly,  
THE STANDARD ORE COMPANY,  
HENRY P. BARBOUR, vice-president.  
DULUTH, MINN., January 18, 1893.

## PERSONAL.

B. F. Fackenthal, manager of the Durham Furnace of Cooper Hewitt & Co., at Riegelsville, Pa., has accepted the presidency of the Thomas Iron Company, Hokendauqua.

Andrew Carnegie has returned from Europe.

James W. Weaver has been elected secretary of the Thomas Iron Company of Hokendauqua.

**The Hamilton Patent.**—A lawyer in Youngstown named Jacobs is issuing letters to rolling mills all over the country, claiming that they are infringing the Hamilton patent, which is for pinion housing boxes cast in one piece. Many of the parties threatened with suit have mills which were built and remain as built before the patent was issued, and in at least one case demands for payment were insisted upon even after the information was given that the mill was built prior to the issue of the patent. The usual practice throughout this country is to use journal boxes in pieces and not the solid one upon which patent is claimed.

The Ancram Iron Company is the name of a new concern which has been formed to work the carbonate of iron deposits near Ancram, N. Y. Robert A. Cook of New Brunswick, N. J., is president, and Warren Delano, Jr., of New York, treasurer. The work of prospecting has been going on quietly for some time, a drill having been kept running nearly all summer. An experimental kiln was also built and a quantity of ore was roasted and shipped to the furnaces, in order to make a practical test of it. The results have proved most satisfactory. The ore makes a very fine quality of steel. The deposit is very large in extent and varies from 10 to 30 feet in thickness.

A cargo of iron ore from Greece was jettisoned in Cape May channel to save the ship, which got ashore.

Pig Iron Production in 1892

The American Iron and Steel Association has just published its report on the production of pig iron for the year 1892.

The total production of pig iron in 1892 was 9,157,000 gross tons, against 8,279,870 tons in 1891 and 9,202,703 tons in 1890. The production in 1892 was only 45,703 tons less than in 1890, in which year our maximum production was attained. The production in the first half of 1892 was much larger than in the last half, the figures being as follows: First half, 4,769,683 tons; second half, 4,387,317 tons. The production in the first half of 1891 was, however, greatly exceeded in the second half, the figures being as follows: First half, 3,368,107 tons; second half, 4,911,763 tons. The extraordinary activity of the second half of 1891 was but slightly checked in the first half of 1892, but in the second half of 1892 this decline in activity was much more marked. Indications now point to a continuance of this decline.

The following figures show the output in detail of the different classes of pig iron. We may state that the association classes as anthracite pig the product of some furnaces which we enter as coke furnaces in our monthly reports:

Production of Charcoal Pig Iron.

	First half 1892.	Second half 1892.	Total, 1892.
Massachusetts.....	4,178	3,768	7,946
Connecticut.....	9,856	7,251	17,107
New York.....	9,193	7,145	16,338
Pennsylvania.....	8,293	8,517	11,810
Maryland.....	4,771	4,989	9,760
Virginia.....	524	1,205	1,729
North Carolina.....	310	.....	310
Georgia.....	3,330	6,620	9,950
Alabama.....	45,773	33,683	79,456
Texas.....	6,403	2,210	8,613
Kentucky.....	3,199	.....	3,199
Tennessee.....	24,563	25,626	50,189
Ohio.....	7,520	11,467	18,987
Michigan.....	91,190	93,231	184,421
Wisconsin.....	48,703	83,423	132,126
Minnesota.....	13,670	14,382	28,052
Missouri.....	3,439	4,189	7,628
Oregon.....	.....	.....	.....
Totals, 1892....	279,915	257,706	537,621
Totals, 1891.....	259,010	317,954	576,964

Production of Bituminous Coal and Coke Pig Iron.

	First half 1892.	Second half 1892.	Total, 1892.
New York.....	33,637	32,214	65,851
Pennsylvania.....	1,447,130	1,253,933	2,701,063
Maryland.....	45,210	44,161	89,371
Virginia.....	163,562	177,556	341,118
North Carolina.....	1,543	1,055	2,598
Alabama.....	433,358	402,482	835,840
West Virginia.....	80,238	74,555	154,793
Kentucky.....	29,450	23,899	53,349
Tennessee.....	132,651	117,241	249,892
Ohio.....	643,815	559,111	1,202,926
Indiana.....	5,431	2,269	7,700
Illinois.....	477,961	471,489	949,450
Wisconsin.....	23,453	69,335	92,835
Minnesota.....	13,218	853	14,071
Missouri.....	16,964	12,004	28,968
Colorado.....	10,448	21,993	32,441
Totals, 1892....	3,558,069	3,264,197	6,822,266
Totals, 1891.....	2,202,044	3,634,754	5,836,798

Production of Anthracite and Mixed Anthracite and Coke Pig Iron.

	First half 1892.	Second half 1892.	Total, 1892.
New York.....	121,008	107,198	228,206
New Jersey.....	44,282	43,693	87,975
Pennsylvania.....	766,409	714,523	1,480,932
Totals, 1892....	931,699	865,414	1,797,113
Totals, 1891.....	907,053	959,055	1,866,108

Production in Certain Districts in 1892.

	First half 1892.	Second half 1892.	Total, 1892.
Pennsylvania.			
Lehigh Valley.....	286,632	271,480	558,112
Schuylkill.....	238,139	210,062	448,201
U. Sus.....	80,120	60,917	141,037
L. Sus.....	227,108	213,886	440,994
Juniata.....	68,920	59,611	128,531
Shenango.....	254,998	151,288	406,284
Allegheny County.....	907,474	867,783	1,775,257
Miscel. bit.....	150,148	133,431	283,579
Charcoal.....	8,293	8,517	11,810
H. R. bit.....	50,763	49,543	100,306
Mah. Valley.....	244,779	232,422	477,201
Hock. Valley.....	30,442	19,415	49,857
Miscel. bit.....	317,831	267,731	575,562
H. R. charcoal.....	7,520	11,467	18,987
Ohio.....			

Production of Bessemer Pig Iron in 1892.

	First half 1892.	Second half 1892.	Total, 1892.
New York.....	72,436	61,287	133,723
New Jersey.....	3,997	13,223	17,225
Pennsylvania.....	1,251,025	1,238,705	2,489,730
Maryland.....	44,248	43,976	88,224
North Carolina.....	1,853	1,055	2,908
West Virginia.....	80,238	74,555	154,793
Kentucky.....	16,815	7,542	24,357
Ohio.....	342,690	296,493	639,183
Illinois.....	389,588	411,073	800,661
Missouri.....	24,969	19,961	44,950
Wisconsin.....	2,800	.....	2,800
Minnesota.....	13,218	853	14,071
Colorado.....	10,448	20,968	31,416
Totals.....	2,254,345	2,189,696	4,444,041

Production of Bessemer Pig Iron in Pennsylvania and Ohio Districts in 1892.

	First half 1892.	Second half 1892.	Total, 1892.
Pennsylvania.			
Lehigh Valley.....	98,365	103,214	201,579
Schuylkill.....	57,931	32,309	90,240
U. Sus.....	57,266	47,870	105,136
L. Sus.....	176,713	196,996	373,709
Juniata.....	.....	70,255	176,205
Shenango.....	105,950	.....	105,950
Allegheny County.....	644,932	679,169	1,324,101
Miscel. bit.....	109,868	108,892	218,760
Ohio.			
Mahoning Valley and Hang- ley and Hang.....	.....	.....	.....
Rock bit.....	95,077	88,663	183,740
Hock. Valley.....	20,357	14,829	35,186
Miscel. bit.....	227,256	193,001	420,257

All the figures in these tables are given in gross tons.

The production of pig iron in 1892 by the nine Southern States of Maryland, Virginia, North Carolina, Georgia, Alabama, Texas, West Virginia, Kentucky and Tennessee was 1,890,167 gross tons, against 1,708,966 tons in 1891, and 1,744,160 tons in 1890. The production in 1892 was the largest the Southern States have yet reached. It was 146,007 gross tons in excess of the production in 1890.

The production of spiegeleisen and ferromanganese in 1892 was much the largest we have yet recorded. It amounted to 179,131 gross tons, against 127,766 tons in 1891 and 133,180 tons in 1890.

The stocks of pig iron which were unsold in the hands of manufacturers or their agents on December 31, 1892, and which were not intended for their own consumption, aggregated 506,116 gross tons, against 596,333 tons at the close of 1891 and 608,921 tons at the close of 1890. Of the above-mentioned stocks at the close of 1892 there were 50,200 tons in the yards of the American Pig Iron Storage Warrant Company and still under the control of the makers. In addition there were in storage warrant yards on December 31, 29,500 tons which the makers no longer controlled. The stocks of unsold pig iron at the close of each of the last five quarters, including storage warrant stocks which were still under the control of the makers, were as follows: December 31, 1891, 596,333 gross tons; March 31, 1892, 718,579 tons; June 30, 1892, 737,946 tons; September 30, 1892, 617,382 tons; December 31, 1892, 506,116 tons.

The following stocks of pig iron which were no longer under the control of the makers were in storage warrant yards at the end of the last five quarters: December 31, 1891, 30,900 gross tons; March 31, 1892, 41,020 tons; June 30, 1892, 37,908 tons; September 30, 1892, 35,050 tons; December 31, 1892, 29,500 tons. The total quantity of pig iron in storage warrant yards at the end of the last five quarters was as follows: December 31, 1891, 51,900 gross tons; March 31, 1892, 62,600 tons; June 30, 1892, 72,900 tons; September 30, 1892, 84,200 tons; December 31, 1892, 79,700 tons.

The foregoing figures of unsold stocks show a steady and gratifying decrease during the last two quarters of 1892.

The number of furnace stacks which were in blast on December 31, 1892, was 253, against 240 on September 30, 256 on June 30, 279 on March 31 and 313 on December 31, 1891.

It may be of interest, in connection with the above figures of the American Iron & Steel Association, to tabulate the sources of the foundry and forge iron produced:

Production of Forge and Foundry Iron.

	Foundry and forge.	Bessemer.
New York.....	160,334	133,723
* New Jersey.....	70,750	17,225
* Pennsylvania.....	1,692,265	2,489,730
Maryland.....	1,147	88,224
North Carolina.....	.....	2,908
West Virginia.....	.....	154,793
Kentucky.....	28,992	24,357
Ohio.....	563,743	639,183
* Illinois.....	148,789	800,661
Wisconsin.....	90,035	2,800
Indiana.....	7,700	.....
Minnesota.....	.....	14,071
Missouri.....	.....	44,950
Colorado.....	.....	31,416
Virginia.....	341,118	.....
Alabama.....	835,840	.....
Tennessee.....	249,892	.....
Totals.....	4,190,606	4,444,041
* Deduct spiegel and ferro.....	179,131	.....
	4,011,475	.....

† Apparently 15,982 tons charcoal iron sold as Bessemer.

The above table is based on the assumption that a very small quantity of charcoal pig has been made for Bessemer purposes. In a general way it will be observed that the production of Bessemer pig has outrun the make of the other grades. In 1890, when the make of pig other than charcoal iron was 8,574,470 gross tons, the production of Bessemer pig was 4,092,343 tons. Last year, with a production of 8,619,379 gross tons of coke and anthracite pig, the production of Bessemer pig was 4,444,041 tons. When it is considered that for 1892 the production of rails was probably 400,000 tons behind that of 1890, it is clear that the consumption of Bessemer pig must have increased about 750,000 tons for other grades of steel, not counting the enlarged output of open-hearth metal, with its utilization of scrap.

Our table shows how largely Pennsylvania and Ohio still control the markets for forge and foundry irons, these two States producing about 2,200,000 tons, as compared with 1,426,850 tons for the Southern States of Alabama, Tennessee and Virginia. The details of some of the Pennsylvania and Ohio districts are of a good deal of interest. We have grouped them in the following table:

	Foundry and forge.	Bessemer.
Lehigh Valley.....	256,533	201,579
Schuylkill Valley.....	357,961	90,240
Upper Susquehanna.....	35,901	105,136
Lower Susquehanna.....	67,285	373,709
Juniata.....	.....	128,531
Shenango Valley.....	230,081	176,205
Allegheny County.....	451,156	1,324,101
Miscell. Penn. Bituminous..	64,819	218,760
Mahoning Valley and Hang- ing Rock.....	593,767	183,740
Hocking Valley.....	14,671	35,186
Miscellaneous Ohio Bitu- minous.....	155,305	420,257

There can be little doubt but what even

at the present writing the proportion of forge and foundry irons in the Shenango and Mahoning valleys, and in the Pittsburgh district, in which a large quantity of forge iron was still made in 1892, is now considerably less, and that smaller quantities will be made in the future. A considerable transfer to Bessemer has already taken place.

## OBITUARY.

JOHN R. LINEN.

John R. Linen, president of the Buffalo Scale Company, Buffalo, N. Y., died at his home in that city on the 10th inst., of heart failure, after a severe illness of many months. Mr. Linen was in the fifty-fifth year of his age. His early life was spent in the vicinity of New York City, where he was engaged in the scale business. In 1864 he moved to Buffalo, where he organized the Buffalo Scale Company, whose products, owing largely to his indefatigable efforts and enterprise, are so widely known. Mr. Linen was president of the company for nearly 25 years. He had been closely identified with many of the best interests of Buffalo, and numerous business and social organizations with which he was connected have passed resolutions referring to his death, which indicate the high regard in which he was held. Mr. Linen was esteemed as a man of sterling probity and charitable disposition, and his decease will be mourned by a large circle of friends, not only in Buffalo, but in other sections of the country.

GEORGE W. PROCTER.

George W. Procter died at his home in Lewisburg, Pa., January 6, 1893, of brain trouble. Mr. Procter has been in the hardware business for 53 years, having been with Chas. Duffield, Carlisle, Pa., from 1839 to 1842; then with Kay & De Haven, Philadelphia, from 1842 to 1845; then with R. & W. C. Biddle & Co. (now the Biddle Hardware Company) until 1864. He then removed to Lewisburg, where he engaged in the hardware business, and so continued until the time of his death. The deceased is referred to as quiet and conservative in disposition, clear-headed, right-hearted and steadfast, impressing those about him with the desirability of an exemplary life.

VICTOR COLLIAU.

Victor Colliau, the well-known inventor, mechanical engineer and artist, died 17th inst., in Detroit. He was born in Paris, France, in 1828. He belonged to a family of ironmasters who for three generations had conducted extensive works at a small town 30 miles from the French capital. Young Colliau was given an excellent education in chemistry and engineering, and had as tutors some of the best instructors of the times. An inventive strain ran through the Colliau family for years before the subject of this sketch was born. The first wire nails ever made by machinery were the result of the genius of his grandfather, and the first machine-made wire rope was the invention of Colliau's father. Having completed his education, he was placed in charge of his father's establishment, a position he held until the business went under in the stagnation which followed the coup d'etat in the '50s. In 1857 some French adventurers formed a bogus stock company for the purpose of working large tracts of mineral lands in West Virginia, and Victor Colliau, at that time a rising young engineer, was employed to superintend the mines. Later Mr. Colliau went back to France, where he saw a device for the saving of fuel in iron melting. He re-

turned to this country and patented an improvement on the French idea. In 1884 he invented the present Colliau cupola.

JAMES BYRNE.

James Byrne, formerly of Albany, N. Y., and a well known business man, died at his residence in Chicago, January 14, after a long illness. Mr. Byrne was a native of Syracuse, N. Y., where, on attaining his majority, he became connected with the hardware firm of Marvin, May & Hermans. In 1858 he went to Albany and entered the hardware house of Erastus Corning & Co., and afterward, in 1864, became a member of the firm of Edward Wilson & Co. On Mr. Wilson's retirement in 1873, the remaining partners, Mr. Byrne and Philip Fitzsimmons, formed the firm of Byrne & Fitzsimmons, which continued until 1880. Mr. Byrne then held a responsible position in the new firm of Corning & Co., who succeeded Byrne & Fitzsimmons. This connection continued until 1886, when Mr. Byrne formed a partnership with Cyrus M. Ward in the hardware business, which continued until its dissolution in 1891. Since then Mr. Byrne had resided with his family at Chicago.

## The Republic Mine.

At the annual meeting of the stockholders of the Republic Iron Company, held at their general offices in the Wade Building, Cleveland, recently, the important questions concerning the company's future policy were decided. The directors have for some time been discussing the question of extending their operations. The Republic Mine is located in the Marquette range. The operations of the company have heretofore been confined to the one mine. President Rees and some of the other directors looked over the Mesaba range during last summer, and thought that valuable machinery at the Republic Mine which cannot be used under existing conditions could be worked to advantage in the Mesaba district. It was accordingly decided that with the ratification of the requisite number of stockholders, the articles of association should be so revised as to allow the company to engage in business outside the State of Michigan.

This was explained to the stockholders, of whom the holders of 87,000 shares were represented at the meeting. Most of them favored the proposed amendment. It met with some opposition, however, less, perhaps, on the merits of the case than because some of the Michigan stockholders had not heretofore had a representation on the board. When this was found to be the only real objection, Charles G. Hickox, Douglas Perkins and S. P. Ely voluntarily retired from the Board of Directors, to give the discontented shareholders some representation. Abraham Hart and W. F. Dummer of Chicago and N. M. Kaufman of Marquette were chosen to fill their places. The other directors, H. B. Perkins of Warren, Ohio, Peter White of Marquette, G. W. R. Matteson of Providence, R. I., W. D. Rees, Samuel Mather and J. V. Painter of Cleveland, were re-elected. The vote on the proposed amendment was unanimously in its favor. The directors met after the stockholders adjourned and elected the old officers for the ensuing year, as follows: W. D. Rees, president and treasurer; H. B. Perkins of Warren, vice-president; W. B. Castle, secretary, and Douglas Perkins, auditor.

In regard to published reports to the effect that the Pottstown Iron Company of Pottstown, Pa., will erect two new blast furnaces during the coming summer, we are advised officially that nothing definite has yet been decided in the matter.

## Washington News.

(From Our Washington Correspondent.)

WASHINGTON, D. C., January 24, 1893.

The friends of the bill to establish a standard gauge for sheet and plate iron, both on the Committee on Coinage, Weights and Measures, and in the House, feel much encouraged at the prospects of action. The committee have authorized a favorable report on the Stone bill, and an effort will be made to have the Committee on Rules fix a day for its consideration.

There is no reason for opposition in the House other than the narrow notions of a few hide-bound partisans, who seem to mix up everything in the line of national legislation to secure uniformity in all the States as an infringement on State rights.

John Jarrett, ex president, and C. H. Kauffman, a member of that organization, are in Washington enlightening legislators who wish to be enlightened on the advantage of establishing a standard gauge as proposed.

Mr. Jarrett says the "benefits to follow from the fixing of a standard weight and thickness for the sheets and plates of iron and steel are many. Take 28 gauge. Some manufacturers make it 8 ounces and others 10 ounces to the square foot. What we want is a uniform standard, as follows: Take a square foot of iron, 1 inch thick, weighing 640 ounces as the basis of calculation. From that uniform thickness and weight we can easily calculate the exact weight of the different thicknesses. The establishment of a uniform standard will be an advantage to the wage worker, the manufacturer and the consumer. The scale which has been submitted differs slightly from the English gauge, but we think the American standard is better, as it is based upon simpler rules and more scientific adjustment of size and weight."

It looks now as if the House Committee on Naval Affairs would drop from the Naval Appropriation bill the authorization of an additional battle ship. It is probable, however, that it will be inserted by the Senate Naval Committee.

Much surprise is expressed at the sudden change of front by Secretary Tracy. The liberal provisions for certain requirements of the navy yards, recommended by the chiefs of bureaus and inserted in the original estimates, were all stricken out. This includes, in some instances, machine tools and other requisites to promote the efficiency of the yards. The Representatives who have navy yards in their districts have formed a combine for mutual benefit and are using all their influence and energies to persuade the committee to incorporate the missing items in their bill. This will be a difficult task without the support of the recommendation of the Secretary of the Navy.

Some time since the War Department at Washington, D. C., appointed a board of engineers to investigate the merits of the Baker patent army wagon, for which letters patent have been granted to James H. Baker of Allegheny, Pa. Within a short time Mr. Baker has received a trial order for the construction of one of these wagons from the War Department.

Jacob Brombacher's Sons, of 30 Cliff street, New York, announce that they are now in a position to do cutting off of iron and steel in rounds and squares up to 4½ inches in diameter, and of other shapes up to 4½ x 6 inches. They are also in a position to do annealing of the most even kind for die blocks, &c., up to 24 x 14 x 8 inches.



## NEW PUBLICATIONS.

**THE IRON AND STEEL MAKER.** By Various Practical Workers. Edited by F. Joynson. Published by Ward, Lock, Bowden & Co., London and New York.

There is a peculiarly insular flavor about the Iron and Steel Maker which will prove striking to American readers. We are accustomed to demand of our technical literature that writers be closely informed concerning what is going on in all parts of the world. We watch with a jealous eye every indication of progress and every bit of evidence establishing supremacy. It is all the more astonishing to us when that spirit is manifestly absent. We know that the more progressive metallurgists and iron masters in England are thoroughly aroused, that they observe with keen criticism the latest developments in this country and on the continent. The work before us breathes quite a different spirit. Even though it be elementary it need not be totally oblivious of the great theoretical researches and of the wonderful practical achievements in other countries during the past decade.

In manner of treatment and in arrangement of matter the work differs radically from the text-books we have become accustomed to. We may add that generally speaking the change does not commend itself. There can be no reasonable excuse for such a proceeding like that taken in the case of the discussion of the blast furnace. Fifty pages are devoted to the subject. Then follow about 20 pages dealing with puddling and rolling, backed up by about 30 pages relating to the manufacture of malleable cast iron and chilled castings. Then suddenly the book takes us back to the blast furnace again, about 70 pages being printed of what is really much better matter on the subject. Finally, as the conclusion of the first part "The Iron Maker," we are carried back again to puddling.

The second part, "The Steel Maker," is a less wicked jumble, but is characterized by the introduction of a good deal of ridiculously antiquated matter. To give long quotations, by way of describing the Bessemer process of to-day, from Bessemer's first papers is absurd. Nor does it seem wise to lumber up a beginner's memory with a long-winded account of Sir William Siemens' long-abandoned efforts to make iron direct from the ore. We find nowhere a line concerning Müllers, and Ehrenwerth's classical researches on the Bessemer and the basic processes, no hint that the progress of the chemical reactions in the Bessemer converter differ widely according to initial temperature, preponderance of one or the other constituent. We can discover nowhere data relating to the life of apparatus, waste of material, product per day or per week and no hint concerning the many puzzling questions which have been so eagerly discussed by metallurgists in all countries during the past two decades.

**THE MINING DIRECTORY AND REFERENCE BOOK.** Published by Poole Brothers, Chicago. Price, \$10.

We are not sufficiently familiar with the present leading producers of gold and silver in the United States to judge of the fact whether the directory just published possesses any claim to being reasonably complete. We do know, however, that in some branches of industry it is woefully defective. To enumerate the Arizona copper mines without including the Copper Queen, to profess to publish a directory of Montana mines without the Anaconda, or to furnish a list of the Michigan producers excluding the Calumet and Hecla, is a somewhat startling proceeding. We find a serious error, too, in the list of zinc smelters, such a concern as the Illinois

Zinc Company of Peru not being among the Illinois works. The same is true of Missouri lead mines, in which the greatest corporation of the State, the St. Joe Lead Company, is missing. It is evident, therefore, that no claim can be made for completeness and the directory can only be useful because it may and does furnish some names and details which are possibly not accessible without tedious inquiry and investigation.

The plant of the Sagendorph Iron Roofing & Corrugating Company, Cincinnati, Ohio, which was recently destroyed by fire, will be rebuilt according to plans which have just been drawn. As the material has been purchased, operations will commence as soon as the weather will permit. The new structure will consist of two sections covering a total depth of 204 feet by 60 feet in width. The front section will be three stories high, having a depth of 134 feet, and the rear section will be two stories in height, with a depth of 70 feet. The two sections will be divided by a substantial fire wall. The first floor of the front section will be used as a stock and receiving room, also for the heavier machinery used in the production of the company's specialties. The first floor of the rear section, 17 x 70 feet, will be fitted up for stabling purposes. The center room of the rear section, 21 x 70 feet, extending to the roof, is to be constructed of fire-proof material, entirely isolating it from the remainder of the premises and will be used for the paint department, in which all paints will be ground and mixed and applied. The west side of this section, 18 x 70 feet, will be given up to boiler, engine and fuel room. The second floor of the front section will be occupied by the company's offices, 30 x 60 feet, stock room and light manufacturing. The rear of the second floor section will be used for the tin and galvanized iron work department. The third floor will be occupied by storage paints, as will also the basement. The company will have one-third more room than in the old plant, and 25 per cent. additional productive capacity. The new plant will be operated under the name of the American Roofing Company, of which Charles Aldrich is president, H. B. Lloyd vice-president, Geo. M. Verity general manager, and R. C. Phillips superintendent. It will be noted that no change in management is made, the business of the Cincinnati plant being conducted as heretofore, with added advantages of increased capital and facilities.

The financial journals report that the Illinois Steel Company's plan is to declare a dividend of \$5 per share, cash, and to represent the accumulated surplus, 13 per cent., in 20-year non-interest bearing scrip. The right is also to be given to the stockholders to take \$7,000,000 of non-convertible 5 per cent. bonds at about 65, and the scrip can be used, as far as it goes, to pay for the bonds. The rights are already quoted at from \$6 to \$7 bid.

Our Duluth correspondent telegraphs that there is no truth in the story that the directors of the West Superior Iron & Steel Company propose to greatly enlarge the works. No increase in the plant has been definitely agreed upon.

The Berlin Smokeless Combustion Company have made contracts with the North German Lloyd and Hamburg-American Steamship companies and the Vulcan Works of Stettin. The principle is the use of coal dust mixed with air for firing furnaces. The attendant advantages are that there is no wear of the boilers and no ashes. The invention is suitable for all kinds of manufactures.

## MANUFACTURING.

## Iron and Steel.

Emma Furnace of the Union Rolling Mill Company, at Cleveland, Ohio, has been making a remarkable record recently. In one week its product was 1402 tons and the following week 1407 tons of Bessemer iron.

A 16-ton fly wheel in the works of the Keystone Rolling Mill Company, Limited, Pittsburgh, Pa., burst last week, doing considerable damage.

The case of the Riverside Iron Works of Wheeling, W. Va., against the Spiral Weld Tube Company was decided in favor of the plaintiff, the defendant not appearing. Plaintiff holds bonds of the defendant to the amount of \$30,000 to secure notes and drafts given, amounting to \$27,626.47. A special commissioner is appointed to sell the bonds.

Rockwood Furnace No. 2 of the Roane Iron Company, at Rockwood, Tenn., which is 15 feet bosh and 60 feet high, equipped with iron stoves, made the following record for the week ending December 31, and which was the forty-ninth consecutive week of the present blast: Iron made, 404 tons; coke (Rockwood) per ton of iron, 88 6-10 bushels; yield of ore, 42 6-10 per cent.; average per day, 57 tons 1620 pounds.

The annual meeting for the election of officers of the Youngstown Stamping Company of Youngstown, Ohio, will be held on Thursday, February 9 next.

Twenty four puddling furnaces in No. 3 department of the plant of the National Tube Works Company, at McKeesport, Pa., will shortly be dismantled in order to give additional room for the new Bessemer plant now being built by that firm.

The Minneapolis Rolling Mill Company, recently organized at Minneapolis, Minn., have let a number of contracts for rolling mill machinery to the Totten & Hogg Iron and Steel Foundry Company, the Leechburg Foundry & Machine Company, both of Pittsburgh, and the Lloyd Booth Company of Youngstown, Ohio.

Posted in conspicuous places in the Beaver Falls Mills of the Carnegie Steel Company, Limited, at Beaver Falls, Pa., are copies of the following notice: Employees at these mills will bear in mind that any attempt to organize labor unions will not be tolerated, and any person or persons attempting to introduce labor organizations in these mills will forthwith be discharged and debarred thereafter from getting employment in any of the works of this firm.

The 14-inch train at the steam mill of the Burden Iron Works, Troy, N. Y., has been fitted with new rollers and converted into a horseshoe train, so that hereafter all the rods for horseshoes will be rolled there and carried by train to the water mill, to be run through the horseshoe machines.

The Corning Steel Company of Hammond, Ind., are doing good work in their new sheet mills. Recently, in the ordinary course of business, they rolled a number of fine steel sheets of No. 32 gauge, 24 inches wide and 130 inches long. These sheets were for trunk-makers' use.

The Bryden Horseshoe Company of Cata-sauqua, Pa., are erecting 14 new furnaces and adding new machinery to their plant, with a view to increasing the capacity. The year just closed was a very prosperous one with the company, and an increased output during the current year will be necessary to keep pace with their growing business.

## Machinery.

Application for a charter for an intended corporation to be known as Mackintosh, Hemphill & Co. has been made. This new concern will succeed the well-known firm of Mackintosh, Hemphill & Co., Limited, of Pittsburgh, manufacturers of engines and rolling mill machinery.

It is reported that the Board of Trade of Massillon, Ohio, has arranged with a concern in Hornellsville, N. Y., who manufacture pulley clutches, to remove to Massillon, Ohio.

Application has been made for a charter for an intended corporation to be known as McGill, Wilcox & Co., Incorporated, of Pittsburgh, the object of which is the manufacture of iron or steel in its various forms. This new concern will succeed to the business of McGill & Co., manufacturers of hydraulic machinery, located at 2626 Smallman street, Pittsburgh, Pa. The incorporators are Jno. J. McGill, Frank Wilcox, Chas. E. Satler, Jno. F. Wilcox and Wm. S. Campbell.

A. J. Sweeney & Sons, general founders and machinists, of Wheeling, recently built a punching machine for the Erie City Iron Works, at Erie, Pa., which is said to have



weighed 28 tons. This is claimed to be the heaviest punching machine ever built in this country.

The skilled workmen formerly employees of J. P. Witherow of Newcastle, Pa., announced that they have subscribed the \$8000 necessary to put the works in operation, and that they will start the plant by February 1.

The Humphrey Turbine & Machine Co., with a capital of \$100,000, have been organized at Cuyahoga Falls, Ohio, for the purpose of manufacturing and dealing in turbine water wheels, water motors and other machinery.

The Westinghouse Electric & Mfg. Company of Pittsburgh have completed the erection of the 12 dynamos to be used to light the World's Fair buildings, and these were on exhibition at the works of the company in Allegheny, Pa., last week. They are claimed to be the largest generating machines ever built, and have a maximum generating power of 15,000 16 candle-power lights. Their weight is about 150,000 pounds, and of the armature about 42,000 pounds. The total horse-power will aggregate 12,000, the largest of any electric light plant in the world. A number of improvements were introduced in the manufacture of these dynamos which have heretofore never been used.

At the annual meeting of the stockholders of Reeves Pulley Company, Columbus, Ind., January 4, 1893, the capital stock of this corporation was doubled, the same fully paid up on above date. In 1888, with a capital of \$40,000, their stock was selling at less than par; an offer for a small amount of same at 300 per cent. above par has been refused.

The Madison Car Company, Madison, Ill., have recently added eight overhead cranes to their wheel foundry. They have adopted the Whiting patent system, manufactured by the Detroit Foundry Equipment Company. This makes a total of 20 cranes of this make in use in this foundry.

The Lane & Bodley Company of Cincinnati have secured an order from the Cincinnati Gas Light & Coke Company for two 30 x 48 Corliss engines for their new Augusta street station, this being the fourth and fifth of this company's make that will be used for lighting purposes by the purchasers.

Wm. Tod & Co. of Youngtown, Ohio, have received the contract for furnishing the engines which will drive the observation wheel at the World's Fair at Chicago. The engines will be a pair coupled to one shaft, with cranks at right angles and fitted with steam reversing gear so as to run backward or forward and to stop and start instantly. The cylinders of these engines are 30 inches in diameter and 4 feet stroke and will weigh about 110 tons, and are capable of exerting 2000 horse-power.

The building occupied by the Ashton Valve Company at Boston, Mass., has been destroyed by fire, together with the machinery and a large amount of finished stock. The loss to the company will probably reach \$125,000.

Paul S. Reeves, Tubal Smelting Works, Philadelphia, made large additions to his plant about a year ago, by which he has been enabled to increase his output during 1892 to the extent of over 33 per cent. The works are equipped with all the modern appliances, including a 15-ton traveling crane and core ovens with a capacity for the largest and heaviest class of work in either brass or bronze castings.

The recently consolidated Atlantic Works and Robinson Boiler Works, at East Boston, Mass., are perfecting plans for the construction of an extensive building which will be erected in the spring.

Fire in the iron works of the Toner Mfg. Company, at Providence, R. I., caused a loss of \$10,000.

The Meridian Foundry & Machine Company of Meridian, Miss., have assigned, with liabilities of \$25,000 and nominal assets of \$40,000. Failure to make collections is said to have caused the trouble.

The foundry of the Vulcan Brass Company, at Cleveland, Ohio, has been destroyed by fire. The structure was very old, and the loss, which will amount to about \$12,000, is mostly on valuable patterns that were burned.

The Williams Engine Works, Beloit, Wis., formerly owned and operated by W. H. & C. E. Wheeler, have been purchased by C. H. Morse of Chicago for \$100,000.

The plant of the Wentworth Spring & Axle Company, at Gardiner, Maine, has been damaged by fire to the amount of \$12,000.

The Acme Machinery Company, Cleveland, Ohio, have been incorporated, with a capital stock of \$150,000, for the purpose of manufacturing machinery.

#### Miscellaneous.

At a meeting of the stockholders of the Equitable Natural Gas Company of Pitts-

burgh, held last week, directors were elected as follows: Reuben Miller, James Hemphill, Robert B. Brown, George Trautman, Charles H. Zug, J. Stuart Brown, Frank B. Robinson, L. M. Morris and Jacob T. Keil. The board organized afterward by electing the following officers: Robert B. Brown, president; James Hemphill, vice-president, and William H. Alldred, secretary and treasurer.

The People's Natural Gas Company of Pittsburgh have declared the regular quarterly dividend of 2 per cent. payable on the 20th inst.

The Hunt & Connell Company, with capital stock of \$60,000, have been organized at Scranton, Pa., for the purpose of engaging in the manufacture of brass, copper, tin and sheet iron ware and other specialties.

The Ironton Stove & Range Company, with a capital of \$50,000, have been organized at Ironton, Ohio, for the purpose of manufacturing and selling stoves, ranges, and castings. The incorporators are: W. C. Amos, H. D. Newcomb, H. A. Key, Martin Schreiber, O. R. Johnson.

The Walter A. Wood Mowing & Reaping Machine Company of Hoosick Falls, N. Y., have purchased the shop rights of the Appleby binder, which will be used in connection with the present manufacture.

The Genesee Molding Company have been incorporated at Rochester, N. Y., with a capital of \$3000. The directors for the first year are: Frank X. Foery, Horace N. Cowles, Abram Wyckhouse and Conrad Kastner.

The Hitchcock Mfg. Company of Cortland, N. Y., have elected: Directors—C. B. Hitchcock, Carrol C. Hitchcock, Harrison Wells. The directors elected: President, C. B. Hitchcock; vice-president and treasurer, C. C. Hitchcock; secretary, H. L. Gleason. The past year has been a most prosperous one for the concern.

The Johnstown Harvester Company of Batavia, N. Y., have elected: Trustees—Byron E. Huntley, E. J. Mockford, E. W. Atwater, S. D. Bentley and Mrs. A. R. Kenney; president, Byron E. Huntley; vice-president and secretary, E. J. Mockford; treasurer, E. W. Atwater.

The citizens of Canton, Ohio, have appointed a committee to secure subscriptions to an increase of capital of the Canton Steel Roofing Company, with a view to retaining the company in Canton.

The National Car Spring Company of New York and the Oswego Railway Spring Company, Limited, of Oswego, N. Y., have consolidated their interests in a new organization to be known as the National Railway Spring Company. The new company are to build at Buffalo, N. Y., a plant with machinery and tools of the most approved type. Until this factory is built the present factories of the company at Newark, N. J., and Oswego, N. Y., having a daily capacity of 30 tons of spirals and 10 tons of elliptics, will be used for the execution of orders. The organization of the new company includes Theo. Irwin, as president, and George B. Sloan, Jr., as secretary and treasurer, who have been connected with the Oswego Spring Company for a number of years. Thomas M. Bell, the vice-president of the company, first entered the spring business in 1880 with the Scott Spring Company of Philadelphia; resigned in 1889 to become vice-president of the National Car Spring Company, with which company he has been connected up to the present time. Edward A. Cliff, the superintendent of the new company, became superintendent of the Vose & Dinsmore Spring Company in 1870, and in 1874 he retained the same position, when the company was reorganized under the name of the National Car Spring Company. In 1880 he resigned to organize and become superintendent of the Cliff & Righter Company of Oswego, N. Y. He resigned the latter position in 1887 to again become the superintendent of the National Car Spring Company, which position he has held up to date. The main office of the company will be at Oswego, N. Y., with branch offices at 115 Broadway and 913 Drexel Building, Philadelphia, Pa.

The Ironton Stove & Range Company of Ironton, Ohio, have been incorporated with a capital stock of \$50,000.

William Buck of Brantford, Canada, has lately installed in his works a new electroplating dynamo. This machine was one of the latest improved American giant dynamos, manufactured by the Zucker & Levett Chemical Company of New York City.

The Johnstown Harvester Company of Batavia, N. Y., have elected the following officers: Trustees, Byron E. Huntley, E. J. Mockford, E. W. Atwater, S. D. Bentley, Mrs. A. R. Kenney. The trustees elected: President, Byron Huntley; vice-president, E. J. Mockford; secretary, E. W. Atwater.

The M. Rumely Company, manufacturers of farm engines and other agricultural machinery

at La Porte, Ind., have materially improved their already extensive plant by the erection of an addition 80 x 210 feet, which will be occupied by the blacksmith and boiler shop; a three-story brick, 40 x 126 feet, for the enlargement of the wood-working department, and power house 30 x 100 feet. The engine room equipment will be enlarged by the addition of a 200 horse-power Corliss engine, while a powerful multiple punch will aid the service in the boiler shop.

Among recently authorized corporations in Illinois are the following: The James Steam Cook Stove Company at Chicago; capital stock, \$150,000; for the manufacture of stoves and kitchen utensils; incorporators, Will. S. James, W. W. Watron and C. S. Neeros. The Fleming Radiator Refrigerator Company, at Chicago; capital stock, \$100,000; for the manufacture of refrigerating apparatus; incorporators, Mathew D. Watson, George Fleming and H. M. Boreman. The Hammond Light & Power Company, at Chicago; capital stock, \$50,000; to furnish light, heat and power; incorporators, Marcus M. Towle, Alonzo Stephens and Frank J. Baker. Mount Carmel Light & Water Company, at Mount Carmel; capital stock, \$50,000; for furnishing electric light, heat, power and water; incorporators, William S. Teed, John B. Ried and Joseph H. Reynolds. The Durand Hardware Company, at Durand, Winnebago County; capital stock, \$10,000; for retailing merchandise; incorporators, C. A. Norton, Frank Shelk and J. N. Geary. The Johnson Giant Grip Vise Company, Chicago; capital stock, \$20,000; incorporators, William Johnson, J. Charles Moore and Edward S. Curtis. The Standard Knife Works, Chicago; capital stock, \$20,000; incorporators, George F. Griffith, Randall W. Burns and George W. Underwood. The Green & Terry Harrow Company, at Chicago; capital stock, \$50,000; for the manufacture of agricultural implements; incorporators, W. W. Green, Francis E. Terry and Josiah Cratty. The Chicago-Topeka Light, Heat & Power Company, at Chicago; capital stock, \$1,200,000; to furnish light, heat and power to be produced by fire, steam, electricity, compressed air and water; incorporators, William Bruce, John G. Campbell and Cornelius V. Smith.

The National Hollow Brake Beam Company of Chicago have leased their entire business, plant and patents to the Chicago Railway Equipment Company, which company manufacture and sell the National hollow brake beams and assume the business heretofore carried on by the brake beam company. E. B. Leigh has accepted the office of general manager of the new company, A. J. Farley and L. C. Burgess will be in charge of the sales in the West, with office 514 Phoenix Building, Chicago, and F. G. Ely in the East, with office Room 118, 29 Broadway, New York. H. S. Burkhardt is president. As heretofore, H. B. Robischung is superintendent of the works. We desire to add that neither the National Hollow Brake Beam Company nor the Chicago Railway Equipment Company are in any way, directly or indirectly, identified with any other brake beam company.

The Howe Scale Works, Rutland, Vt., have closed for inventory and to replace the old boilers with new and larger ones. Superintendent Johnson will complete this work as soon as possible. He says that orders are coming in much more rapidly than at this time in previous years, and it will not be necessary to put the men on three-quarter time, as has been done sometimes from lack of business. The company have placed electric lights in the plant to enable the men to work nights. They have also found it necessary to increase the working capacity of the new machine shop and the new portion of the other building in order to make room for new machinery which will soon be put in. The company employ about 400 men, and when the spring work is under way will increase the number to nearly 500.

It is reported that the New York Central & Hudson River Railroad Company and other leading railroad companies have become interested in the New York air brake, manufactured at Watertown, N. Y., and that in consequence the plant will be greatly enlarged, so as to employ 1500 men. It employs at present only 500. It is said that the works will remain in Watertown on account of its exceptional water facilities. It is also said that when the facilities are increased the plant will occupy all of Beebee's Island, a valuable piece of property located near the center of the city.

The mill belonging to the Oliver Brothers at Lockport, N. Y., is being turned into a manufacturing plant. As soon as ready it will be used as a plant to manufacture brass and iron bedsteads. The capacity will be 40 brass and 20 iron bedsteads a day. Over 200 men will be employed and the plant will be constructed to accommodate 400 workmen if necessary. In addition a foundry 51 x 70 feet will be erected.

# TRADE REPORT.

The Ore situation in Cleveland has not yet developed. It is reported that the large companies who control the leading mines in the older ranges are earnestly discussing what course would be the best. Some argue that it would be wiser to let the Mesaba range mines sell all they can at their own prices and then take the balance of the requirements at figures fixed by concerted action. The point is made that the furnaces cannot run on Mesaba alone, and must, therefore, buy other Lake ores. Others incline to the opinion that the great companies should take the bull by the horns and force the fighting.

Reports from the Western Pig Iron markets and of Chicago in particular indicate that the Northern furnaces are capturing what large business is doing, and that therefore the Southern makers who have long held to their prices are losing ground. How long they will look on and where they will seek relief remains to be seen.

The sensation of the week has been a further decline in Bessemer Pig in Pittsburgh to \$13.25, with intimations that even lower figures have been made under special circumstances.

In Manganiferous material a heavy business has been done at declining prices. An Eastern mill has taken several thousand tons of Spiegeleisen, and large quantities of Foreign Ferromanganese have been placed. From Western Pennsylvania come reports of very low prices on domestic Ferro.

Billets have declined in Pittsburgh and Wheeling in sympathy with Bessemer Pig and \$21.25 has been done, with sales in the East by Eastern mills at prices very close to parity of that price. The trade is discussing with a good deal of animation the question of what Billets cost. For conversion of Bessemer Pig into Soft Billets \$8 per ton is stated by leading makers to be a very close figure, while others claim that only \$9 will cover it. Still \$7.50 is sometimes talked of as a possibility for well-managed plants.

Every week seems to bring fresh surprises in the way of low prices in Finished Iron and Steel. The sad work of record breaking is going on with undiminished energy, until manufacturers and merchants are utterly at sea.

Yet business is very heavy. This week's record alone shows that. Our reports record the placing of the order for 10,000 to 11,000 tons for the Government vessels, the Plates going to Pittsburgh and the Shapes to Eastern Pennsylvania. A lot of 9000 tons of Plates for the Rochester Pipe line has also been booked. This week the Cramps will place 20,000 tons for the Atlantic liners. The Chicago trade is agitated over the early closing of 6500 tons of Light Plates for the Pacific Coast.

There have been some fair orders for Plates and Structural Material in the New York market, where a 500-ton contract for elevated work has gone to a Central Pennsylvania mill at an unprecedentedly low figure.

The Bar-Iron market is reported in a demoralized condition in Chicago, the lowest prices on record having been made during the week. Pittsburgh and Eastern Pennsylvania also report a decided weakening. Some very low prices have been made on Hoops. Cutting is going on in the Wire-Nail trade, and the Cut-Nail business continues to suffer keenly, particularly in the West.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }  
Pittsburgh, January 24, 1893.

The fourth week in January has been reached, and the expected improvement in the condition of the Iron and Steel trades has not come. It is true that the excessively cold weather of the past three or four weeks has interfered with business to no slight extent, but it is also true that much of the new business transacted since the first of the year was brought about in many cases by liberal concessions on the part of sellers. For this reason, it is plainly evident that the advantages of the market are still on the side of buyers, and they are being used in a most effective manner. It is admitted on all sides that just as soon as buyers regain confidence in the market and commence to anticipate their wants an improvement in the present badly demoralized condition of the trade will take place. One thing is certain—if prices go any lower than they are now a number of sellers will be compelled to withdraw their product from the market, and this in a measure has already taken place, as a number of furnace operators have already declined to meet prices ruling in this market. A perusal of prices quoted below on the different articles of Iron and Steel will show conclusively that only those concerns who have modern-equipped plants in every way can market their product at these prices and come out even or, at best, with a small profit.

For the week under review Bessemer Iron, Structural Material and Billets have further declined in price, the greatest decline being in Bessemer Pig, which has gone off from 25¢ to 35¢ per ton below lowest previous quotations.

**Pig Iron.**—Within the past week a sharp decline in price of Bessemer Pig occurred, and this is now being freely offered on a basis of \$13.25, f.o.b. cars Pittsburgh, with reliable reports that several makers have offered to shade this extremely low price from 10¢ to 15¢ per ton. This slump in price was entirely unexpected, as only 24 hours before it occurred a sale of 600 tons of Bessemer was made by a large producer in this city on a basis of \$13.40, Pittsburgh, and another of 200 tons on a basis of \$13.50, Pittsburgh, for prompt delivery. When it became known, however, that 3000 tons of Bessemer had changed hands at \$13.25, Pittsburgh, a number of sellers at once offered to meet this price, and in two instances, where large blocks were involved, offers were made to shade it to some extent. At this writing a deal involving a large block of Bessemer is pending, the buyer claiming to have been offered the Iron at \$13.10, Pittsburgh, but refusing to buy, even at that extraordinarily low price. As to what caused the slump opinions differ. It is claimed by some that it was brought about by pressure on the part of furnaces to unload surplus stocks, while others claim the break was made voluntarily by furnaces with the object of influencing prices for this year's supply of ore. It is not unreasonable to suppose that both of the causes noted above had considerable to do with bringing about this sharp decline, which is the severest that has yet occurred. As to how it will affect sales remains to be seen, but it is the impression that considerable Iron will change hands before this month is out. In Gray Forge the established price of \$12.25, Pittsburgh, is seemingly being maintained with comparatively little Iron changing hands. Reports are going that offers to slightly shade this price have been made, but these reports have not been verified. Only a moderate amount of Foundry is selling on a basis of \$14 for

No. 1, and \$13 for No. 2. We quote the market as follows:

Neutral Gray Forge.....	\$12.25 @	cash.
All-Ore Mill.....	12.50 @	12.75, "
No. 1 Foundry.....	14.00 @	14.10, "
No. 2 Foundry.....	12.00 @	13.00, "
Charcoal Foundry No. 1.....	19.00 @	20.00, "
Charcoal Foundry No. 2.....	18.50 @	19.00, "
Bessemer Pig.....	13.25 @	"

We note a sale of 3000 tons of Bessemer at \$13.25, Pittsburgh, equal deliveries in February, March and April; 2000 tons at same price for January and February delivery; 600 tons at \$13.40, Pittsburgh, for prompt delivery, and 600 tons of Gray Forge for January and February delivery at \$12.25, Pittsburgh.

**Ferromanganese.**—Owing to severe competition a further decline in price of domestic has occurred, and we now quote this at \$60, Pittsburgh, and report a sale of 100 tons at that price. Considerable speculation is being indulged in as to who the buyers are of the 750 tons of Ferro reported last week as having been sold in this market. The price is said to have been about \$59, delivered, Pittsburgh, the deliveries being 125 tons per month from February to July, both inclusive.

**Billets.**—An easier tone pervades the market, and offers to shade \$21.50 at makers' mill have been made since our last report. A large consumer in this section has recently contracted for a fair-sized block of Billets on the basis of \$21.50, delivered at buyers' works. As to the immediate future of the market very little can be said with certainty. The recent drop in the price of Bessemer Iron may still further weaken the Billet market, but this remains to be seen. It is evident, however, that large buyers believe that prices have not yet reached their level, and as a consequence are still holding off from buying. Some makers both in this city and the Wheeling district are still firm in their refusal to go below \$21.50, and announce that they will clean up present orders and take their chances on prices when they are ready to take new business. We are advised of two sales in the Wheeling district, one of 1500 tons and the other 2500 tons, at prices equal to about \$21.25 at makers' works. Edgar Thomson is again on Rails, and this may favorably affect the situation.

**Structural Material.**—A further decline in prices of from \$2 to \$3 per ton in Beams and Channels has occurred, and we now quote these on a basis of 1.90¢ @ 1.95¢, f.o.b. cars Pittsburgh. Angles we quote at 1.70¢ @ 1.75¢; Universal Mill Plates, 1.70¢ @ 1.75¢; Z Bars, 1.90¢ and Tees 2.10¢ @ 2.15¢. We are advised that owing to the extreme low prices prevailing for all kinds of Structural Material, it is probable that consumption will be very largely increased, as Steel will be substituted in many places instead of wood. The excavating for the new Carnegie office building on Fifth avenue in this city is about completed, and work on the foundations will be commenced in a short time. This building will be one of the finest structures in Pittsburgh and a good many tons of Structural Material will be used in its construction. New business coming in at this time continues to be almost exclusively for small lots, although with warmer weather, which would permit outside building operations, an improved demand would no doubt be experienced.

**Steel Plates.**—There is nothing new to report this week, trade being quiet and only a moderate amount of material changing hands. We have reduced prices on Bridge Plates and Shell Steel and now quote the market as follows: Flange, 2.05¢ @ 2.10¢; best Fire Box, 3.40¢ @ 3.50¢; Tank, 1.70¢ @ 1.75¢; Bridge Plates, 1.90¢; Shell, 1.95¢ @ 2¢.

**Steel Rails.**—Edgar Thomson mill went on Rails again on Monday morning, the 23d inst. We are advised that some contracts were closed which warranted the return of this plant to Rails. The new department of the Edgar Thomson where light Rails weighing 45 pounds and under are rolled is in successful operation and turning out a large product. Prices are without change, and we quote at \$29 at mill for standard sections.

**Muck Bars.**—A few lots of Muck Bars continue to change hands, the principal buyers being Pipe and Tube makers who have contracts for delivery of Pipes and Tubes. Outside of purchases of this character very little Muck Bar is changing hands, nor can any improvement in demand be expected under existing conditions. Many concerns are puddling as little Iron as possible, and, as stated before, several of the largest firms in this city have abandoned it altogether. We are advised of three sales of Muck Bars made during the past week, aggregating about 1100 tons, at a price equal to \$24.25, Pittsburgh, which may be considered the ruling price in this market.

**Wire Rods.**—Owing to the dull demand for Wire Nails the demand for Rods continues quiet, although a few lots continue to change hands on a basis of about \$30, Pittsburgh, which may be considered as a quotation for this market. One concern in this city reports having made several sales last week of small lots at the above price. The Rod mill of the Consolidated Steel & Wire Company of this city is in full operation on double turn, their product, however, being consumed by themselves.

**Merchant Steel.**—The extreme cold weather prevalent for the past three or four weeks has, no doubt, interfered with business to a considerable extent, but now that we are favored with more moderate weather an increased volume may be confidently expected. Considerable business now being placed comes from jobbers, but actual consumers are expected to enter the market in a very short time. Prices show little change, and we continue to quote Open Hearth Spring and Machinery at 2¢ @ 2.15¢; Machine Tire Steel 2¢, and Ordinary 1.80¢ base. Plow Steel we quote at 2¢ @ 2.10¢, Sleigh Shoe, flat bars, at 2¢. Tool Steel is ruling at 6¢ and upward.

**Bars.**—Now that the weather has moderated sufficiently to allow prompt delivery of fuel to the mills, greater activity is expected to prevail from this time forward. While a fair amount of business has been booked since the first of the year, the amount is considerably below expectations, and the outlook for the future is not as bright as could be desired. Prices have shown a tendency to weaken, due to the keen competition among makers to capture new business. We are advised of a sale of 500 tons of No. 1 Bars for Eastern shipment on a basis of 1.60¢, Pittsburgh. We continue to quote No. 1 Bars at 1.60¢ @ 1.65¢, half extras, but on desirable orders these prices might be shaded slightly. In the valley Bars are held at 1.45¢, half extras.

**Wire and Cut Nails.**—Business in both Wire and Cut Nails is in a very unsatisfactory condition, and this applies not only to volume of trade, but to prices as well. Very little information that is reliable has been received in this city as yet regarding the new combine which is to embrace manufacturers of Wire, Wire Nails and Wire Rods. Jobbers here believe that if such a combine could be arranged, and only moderate advance in prices were made, it would be a good thing for everybody. Prices of Wire Nails continue to rule at \$1.40 in carload lots, but this price continues to be shaded under

desirable conditions. Probably never in the history of the trade was the demand for Cut Nails as dull as at the present time, and while some little improvement may be experienced when building operations commence, it is the general belief that the use of Cut Nails will diminish right along and Wire Nails will be used in their stead. We continue to quote Cut Nails at \$1.42½ @ \$1.45 on a 30-cent average in the Wheeling district, with very little business doing.

**Sheets.**—A fair demand is going, and it was fully expected that a number of season contracts would have been placed before this time, but the cold weather has interfered, and, as far as we are advised, few, if any, season contracts have been placed. Buyers continue to demand that their business be taken at extremely close prices, and in some cases figures submitted by buyers have been refused. For ordinary lots of Common Black Sheets the following prices are ruling: No. 24, 2.55¢ @ 2.60¢; No. 26, 2.65¢ @ 2.70¢, and No. 27, 2.75¢ @ 2.80¢. For Soft Steel Sheets the usual advances on the above prices are obtained. Galvanized Sheets continue in fair demand, with discounts ranging from 70 and 7½ % to 70 and 10 %, according to quantity and nature of order, for Best Bloom.

**Skelp Iron.**—Demand is very dull, and as a consequence prices are weak and liable to go even lower. For Grooved Skelp makers continue to ask 1.50¢ @ 1.55¢; for Sheared 1.70¢ @ 1.75¢, four months, or 2 % off for cash, but it is evident that these prices are being shaded to some extent right along.

**Wire.**—A good many season contracts are reported as having been placed, and one concern in this city making both plain and Galvanized Wire is said to have booked a very large amount of business within the last month. As yet prices have not shown any tendency to advance, and we continue to quote plain Barb Wire at 2¢ and Galvanized at 2.40¢, in carload lots.

**Scrap Iron and Steel.**—For the past week or two trade has been somewhat quiet, and prices on No. 1 Railroad Wrought Scrap have slightly declined. We now quote this at \$15.50 @ \$16 ¢ net ton. The shortage in supply referred to in our report of last week seems to have disappeared, and considerable material is available. Cast-Iron Borings we quote at \$8 ¢ gross ton, and Wrought-Iron Turnings at \$10.75 ¢ net ton.

**Old Iron Rails.**—Very little business is doing, and prices quoted last week about represent what is being obtained for the small amount of material that is now changing hands. We continue to quote Short Steel Rails at \$16, while long and miscellaneous lengths are bringing about \$15.50; Old Iron Rails are held at about \$20, delivered in Mahoning Valley.

(By Telegraph.)

Bessemer market somewhat stronger, and while one block has changed hands at less than \$13.25 Pittsburgh, it is doubtful if \$13.25 could be shaded to-day.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street, Chicago, January 25, 1893.

Prices have receded further during the past week, under sharp competition by manufacturers of Pig Iron, as well as some classes of finished products. The concessions which have been made appear to have created considerable business which has been pending for some time and the prospects are good for further transactions.

The peculiarity of the situation is that just now sellers appear to be somewhat at sea regarding prices, as competition has developed from unexpected sources and it is difficult to say how low a level has been reached on some of the largest orders. An unpleasant feature of the existing condition is the scarcity of money. Considerable complaint is heard of slow collections, for the first time for over a year.

**Pig Iron.**—Another week of heavy transactions has passed, but still the activity is not general; in this respect the more sanguine sellers have been disappointed. The local manufacturers have taken the bulk of the business, leaving only the trade in small lots for quick delivery to the sellers of Southern Iron. The latter report that a very good demand exists for such quantities, but as soon as they figure on large lots they come in almost hopeless competition with local producers. Southern prices will have to recede considerably to enable the makers of that section to secure any considerable part of the trade which is now developing. Prices on small lots are about as reported last week, but on very desirable orders from the best class of consumers prices have been made on local brands which are down very close to the lowest figures made in the most depressed period of last year. This causes regular consumers of Southern Iron to withhold their orders in the belief that Southern prices will also come down to the level which they reached at that time. The reductions in price are stated to have operated differently from their usual course. Generally buyers are scared off by concessions, but now they evidently recognize that makers are selling close to the cost and they are thus willing to buy when they find them at least ready in part to meet their views. More negotiations are pending in Coke Iron, and it is likely that the present week will see considerable business closed. The sales made last week cover Bessemer Iron as well as Foundry. Lake Superior Charcoal has been sold in small lots, the demand being principally for No. 1, which has brought \$16.75 @ \$17. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$16.50 @ \$17.00
Local Coke Foundry, No. 1.....	13.75 @ 14.25
Local Coke Foundry, No. 2.....	13.25 @ 13.75
Local Coke Foundry, No. 3.....	13.00 @ 13.25
Local Scotch.....	14.25 @ 14.75
Ohio Strong Softeners.....	16.25 @ 17.00
Southern Coke, No. 2.....	13.35 @ 13.60
Southern Coke, No. 3.....	13.00 @ 13.25
Southern, No. 1, Soft.....	13.35 @ 13.60
Southern, No. 2, Soft.....	13.00 @ 13.25
Southern Gray Forge.....	12.80 @ 12.90
Southern Mottled.....	12.50 @ 12.75
Tennessee Charcoal, No. 1.....	16.50 @ 17.50
Alabama Car Wheel.....	18.35 @ 19.85
Coke Bessemer.....	14.00 @ 14.50
Hocking Valley, No. 1.....	17.00 @ 17.50
Jackson County Silvery.....	17.00 @ 17.50

**Bars.**—The Bar Iron trade is in a demoralized condition, owing to the keen competition for business among the mills of the various sections which sell Iron here. The special point of attack appears to have been on Hoops, on which Pittsburgh manufacturers have made exceedingly low prices. This has carried ordinary Bar Iron down as well. The general quotation now made by manufacturers is 1.55¢, Chicago, half extras, on mill shipment, but this price is shaded on good specifications. Some dealers report the trade so demoralized that they are unable to guess what the actual rate which would secure business is. Representatives of some of the best mills state that they have made the lowest quotations the past week for many years and yet have been unable to secure contracts. It is known that a great deal of Iron has been sold in this market for special terms. The jobbers are also taking a hand in the demoralization and are competing for trade which usually goes to the mills, naming figures which are so close to mill prices that it is diffi-

cult to see how they can realize any profit on such transactions, Soft Bar Steel is still quoted at 1.70¢ @ 1.77½¢, Chicago, according to quality. Prices for small lots from store range from 1.70¢ to 1.80¢ on Bar Iron, and 1.80¢ @ 1.90¢ on Soft Bar Steel.

**Structural Material.**—Sales recently have been confined to small lots only. A great deal of figuring is being done on large buildings, but so far as known none are yet in shape to announce results. Mill lots of Beams continue to be quoted at 2.17½¢, but large contracts could be placed at considerably better figures. Small lots are now selling at 2.25¢ from stock; Angles and Universal Plates, mill shipment, are quoted at 1.90¢ @ 2¢, Chicago.

**Plates.**—An inquiry is reported for 6500 tons of Light Steel Plates for the Pacific Coast. This is the largest inquiry of the kind which has come upon the market for a long time, and is likely to draw out some exceedingly low quotations. Mill orders generally are light and manufacturers are competing for them very sharply. We continue the nominal quotation of 1.90¢ @ 2¢ for Tank Steel, Chicago delivery, but this is being shaded by not only Pittsburgh mills but by concerns further East. Store prices continue nominally as reported last week, but concessions are being made on desirable orders. Store prices continue as follows: No. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.25¢ @ 2.40¢; Shell, 2.40¢ @ 2.60¢; Flange Steel, 2.70¢ @ 2.90¢. Tubes are quoted at 60 % off.

**Sheets.**—Black Sheets are very quiet, both as to sales and inquiries. No. 27 Common Sheet Iron is quoted at 2.85¢ @ 2.90¢, from mill, for Chicago delivery, but good buyers can doubtless do somewhat better. Steel Sheets are still quoted on the basis of 3¢, Chicago, for No. 27. Galvanized Iron is selling about in the usual way for the season, manufacturers' agents not now expecting large orders. Stocks are in good shape in local warehouses and the trade is being very promptly supplied. Mill prices on Juniata range from 70 and 7½ % to 70 and 10 % discount, with small lots selling at 70 % off. Nothing new is reported in Copper Sheets, which are held at 30 % off on small lots.

**Merchant Steel.**—This branch shows no change, as the mills continue to be well employed and are still in receipt of a fair volume of trade. Best grades of Open-Hearth Spring and Machinery continue to be quoted at 2¢ @ 2.20¢, Chicago, from mill, and Ordinary Tool sells at 6¢ @ 7¢, according to quantity.

**Rails and Track Supplies.**—In the absence of anything special in this market we continue to quote standard sections of Steel Rails at \$30 @ \$32, according to quantity, &c.; Iron and Steel Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, with hexagonal nuts, 2.60¢ @ 2.70¢; Spikes, 2¢ @ 2.05¢. Rather cheerful reports come from sellers of Rails further East, who find that the demand, although running to small lots, is considerably better than they had reason to expect.

**Old Rails and Wheels.**—Old Iron Rails seem to be scarce, and if the views of sellers alone were considered the price would be marked up to somewhere about \$19. At present consumers are well supplied, and are not even making offers. It is therefore difficult to name a price which would represent the actual value of this class of material at present. Old Steel Rails are still quoted at \$11.50 for short pieces and \$13.25 for long lengths. Sales of old Car Wheels have been made at \$14.75 @ \$15. Much more has been done in this line the past week than for a considerable period previously.

**Scrap.**—Dealers report a better movement in Wrought and other classes of

Rolling Mill Scrap the past week. The demand, however, has come from so few establishments that it cannot be considered general or as indicative of an improved condition of trade. Dealers' quote the following selling prices: No. 1 Railroad Forge, \$16; No. 1 Dealers' Forge \$15 @ \$15.50; No. 1 Mill, \$10.50 @ \$11; Pipes, \$10.50 @ \$11; Cast Borings, \$5.50 @ \$6; Wrought Turnings, \$8; Axle Turnings, \$10 @ \$10.50; Axles, \$18.50 @ \$19; Fish Plates, \$17.50 @ \$18; Horseshoes, \$16 @ \$16.50; Stove Plates, \$8; Heavy Cast, \$11; Malleable Cast, \$10; Mixed Steel, \$10.50, gross ton; Locomotive Tires, \$12.50; Leaf Steel, \$18; Coil Steel, \$15.

**Metals.**—Copper is unchanged at 20½¢ for carload lots of Lake, and 11½¢ for Casting Copper. Spelter, 4 15¢ @ 4.20¢. Pig Lead, 3.65¢ @ 3.70¢. Business is quiet in the whole line of Metals.

Dunham, Keedy & Co., dealers in Pig Iron and Iron Ore, have removed their offices from 939 The Rookery to 1001 Monadnock Building, Chicago. They offer the trade a full line of all grades of Iron, including Standard Southern, Ohio Soft and Lake Superior Charcoal and Coke Irons.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., January 24, 1893.

The feeling does not appear to be as uniformly strong as it was a week ago, although the general developments have been favorable. Prices are unchanged, and it is doubtful if anything could be had for less money; but the feeling of buoyancy is less marked, and in some lines it is claimed that it requires considerable urging to get a large sale through without making some sort of a concession. There is no particular reason for anything of this kind, except that consumers are not inclined to buy anything that is not needed at once, and the more they are pushed the less disposed they are to do anything. Pittsburgh reports have also been somewhat weak, and in the absence of any sustained demand in this vicinity the tendency has been to let things drift along until there is something definite—favorable or the reverse. Prospects are no less encouraging than they were a week ago, but the business that everybody is looking for is still in the future. Some of these days it will be business in hand, but it is not in hand yet, so that practically the famine is still on. The chances appear to be that certain contracts for large quantities of material will be given out before the end of the month, but as this seemed to be just as likely a month ago, the trade place very little reliance on anything but what they actually have in hand. Nevertheless, when contracts are signed to build ships which will require 30,000 to 40,000 tons of material, manufacturers naturally feel that they will have a chance at it before long. Apart from this, there are various projects looming up, which make an enormous aggregate, and they are all sure to materialize within 60 or 90 days—it may be sooner than that—and besides it is understood that the Structural mills have already a great deal more work on their books than they have had for years past. Some of the Plate mills are fairly well employed, but the Bar mills are dull, so also the Pipe mills and Nail works. The Foundry trade has been pretty good, and, while there is a temporary slackness, the average is considered very satisfactory. Since writing the above large contracts have been closed, as mentioned in another paragraph.

**Pig Iron.**—It seems almost impossible to keep things moving as the trade would like to see. Spurts of activity and indications of strength are followed by dull-

ness and irregularity, so that in comparing prices one week with another, there is no decided improvement in any direction. During the past few days some sellers have complained that there is no market at quoted rates, while others take the ground that quotations are too low. As a matter of fact, they are in accordance with the market, business having been done and is being done daily at extreme prices both ways. A \$14.50 Iron cannot be sold at \$15, however, neither can a \$15 brand be bought at \$14.50, and that probably is all that is wrong with the quotations. Buyers could be found for large blocks of Iron at a slight shading from quoted rates, particularly on the lower grades, but owing to light offerings from the South, prices for this class of Iron are firmer than they have been for some time past. The higher grades move about in proportion to the supply, and show no change in prices, which for Philadelphia and equivalent points are about as follows, and for Southern Iron somewhat lower figures for deliveries at Baltimore and intermediate points to Harrisburg:

American Scotch, No. 1X.....	\$17.00 @	\$17.25
American Scotch, No. 2X.....	16.00 @	16.25
Standard Penna. (Lake Ore), No. 1X.....	14.75 @	15.25
Standard Penna. (Lake Ore), No. 2X.....	14.25 @	14.50
Standard Virginia, No. 1X.....	14.75 @	15.00
Standard Virginia, No. 2X.....	14.00 @	14.25
Virginia and Southern, No. 1X.....	14.50 @	14.75
Soft.....	14.50 @	14.75
Virginia and Southern, No. 2X.....	13.50 @	13.75
Standard Penna. and Virginia.....	13.00 @	13.25
Forge.....	12.50 @	12.75
Ordinary Forge.....	12.50 @	12.75

**Bessemer and Low Phosphorus.**—Market weak and lower. Orders could be placed at \$15 @ \$17, f.o.b. furnace; but there is very little demand, although it is understood that several thousand tons of the former were sold to-day at a price very near to the figure above named.

**Steel Billets.**—Market unsettled and irregular. Quotations from Pittsburgh and Wheeling are made at \$23.75 @ \$24, delivered at Schuylkill Valley points, but it is very difficult to effect sales. Eastern mills are quoting \$24.25 @ \$24.50 and appear to be getting most of the business, partly because of the greater convenience in the matter of deliveries, and partly because of the greater uniformity in quality. Judging by local conditions it may be inferred that the market is on the eve of improvement, but so long as quotations are kept at about \$21.50, Pittsburgh or Wheeling, it is impossible for prices to go much beyond \$24 here, although as we said before, consumers are willing to pay more for Eastern qualities and deliveries than for those from a distance.

**Steel Rails.**—There is only a small business offering at quoted rates, buyers being under the impression that they may do better by waiting, while in any event they will have no difficulty in getting anything they need at quoted rates; say \$29, f. o. b. cars at mills. The opinion prevails that the low price of Steel in other forms must ultimately extend to the Rail trade, although, of course, that will depend entirely upon what manufacturers may decide upon. They are certainly not getting much business at \$29.

**Muck Bars.**—Sellers are anxious to find a market at from \$23.75 to \$24, delivered, but there appears to be no demand, so that these figures are purely nominal.

**Bars.**—Dull and weak. City deliveries for Best Refined Bars are quoted 1.65¢ @ 1.70¢, but at interior points 1.60¢ can be sharply shaded for a good-sized order. The demand is very disappointing, and until car shops get work in hand there is not much chance of improvement in the Bar trade. One or two fair-sized orders for cars have just been given out in the vicinity of Harrisburg, but the Middle and Western States seem to outbid the Pennsylvania



shops for most of the work, lumber being relatively cheaper than in this vicinity.

**Plates.**—As remarked for several weeks past, there is business enough in sight to satisfy everybody, but the difficulty is to get hold of it. Some of the mills are doing fairly on small hand-to-mouth orders, but with nothing of any account to fall back upon; business is competed for as sharply as though it was almost the very last chance. It is hoped that next week will enable us to say something definite in regard to the Cramp Shipbuilding Company's orders; meanwhile bids to the extent of about 30,000 tons are being asked for. There is a good deal of other work in prospect, but everything waits until this order is placed. Pittsburgh will doubtless compel the Eastern mills to make extremely low figures, but it is regarded as settled that the Smoky City will secure a portion of the order, perhaps the larger portion of it, as mills hereabouts have a limit beyond which they will not compete. It is thought that when this order is out of the way prices will stiffen, but in the meantime general quotations are about as follows:

	Iron.	Steel.
Tank Plates.....	1.80 @ 1.90¢	1.85 @ 1.90¢
Shell.....		2.10 @ 2.20¢
Flange.....	2.70 @ 2.90¢	2.40 @ 2.50¢
Fire Box.....	3.00 @ 4.00¢	2.60 @ 2.70¢
Special qualities.....		3.25 @ 3.75¢

Wm. Cramp & Sons placed their contracts yesterday for the material for the construction of the seagoing ship "Iowa" and armored cruiser "Brooklyn," comprising the Steel Shapes (Frames, Deck Beams, &c.), Hull Plating, Boiler Plates, Protective Deck Plates (for the several courses), including Plain Steel, Nickel Steel and Nickel Steel oil tempered and annealed; the tonnage aggregating 10,000 to 11,000 tons. The award was made to the Carbon Steel Company of Pittsburgh, through their Eastern representatives here—Jas. G. Lindsay & Co.

The Carbon Steel Company have had a very successful experience with the Messrs. Cramp & Sons in furnishing the material for Cruiser No. 13, as to the quality and finish of their Nickel Steel Plates and Boiler Plates, and are to be congratulated on their success in securing this contract. The Shapes, amounting to 3000 or 4000 tons, we understand, are to be furnished by the Phoenix Iron Company, the order for which was also placed through Jas. G. Lindsay & Co.

Bids for the material for the Atlantic liners, amounting to about 20,000 tons, are to be acted upon before the close of the week.

**Structural Material.**—There is nothing specially new to report except that mills are fairly supplied with orders and have expectations of a continued good demand during the spring and summer months. Prices are said to be a little firmer, but Western competition is very strong, and when the order is of any importance quotations are not very closely adhered to. For small lots prices delivered are about as follows: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.85¢ @ 1.95¢; Universal Plates, 1.9¢ @ 1.95¢.

**Sheets.**—There is quite an active inquiry and bids for some very large lots have been made during the past few days, although in most cases at prices below what sellers feel inclined to accept. There is every reason to expect an unusually large trade in Sheets, and while prices can be shaded for desirable orders and prompt delivery, manufacturers are not much inclined to enter very far ahead, unless at full quoted rates, as follows:

Best Refined, Nos. 14 to 20.....	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24.....	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26.....	3.15¢ @ 3.20¢

Best Refined, No. 27.....	3.30¢ @ 3.40¢
Best Refined, No. 28.....	3.40¢ @ 3.50¢
Common, ¼¢ less than the above.	

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than are here named:

Best Soft Steel, Nos. 14 to 16.....	2½¢ @ 2½¢
Best Soft Steel, Nos. 18 to 20.....	3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 25 to 26.....	3½¢ @ 3½¢
Best Soft Steel, Nos. 27 to 28.....	3½¢ @ 4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount....	70 and 5 %

**Old Material.**—For prompt delivery, and especially for Steel Scrap, there is a very good demand at full quoted rates. In fact, the entire market shows signs of renewed activity, and quoted rates or sometimes a little better are easily realized, as follows: Old Iron Rails, \$18 @ \$19, delivered; Old Street Rails, \$19 @ \$20; Old Steel Rails, \$15 @ \$16; No. 1 Railroad Scrap, \$16 @ \$16.50, Philadelphia, or for deliveries at mills in the interior, \$16 @ \$17, according to distance and quality; \$8 @ \$9 for No. 2 Light; \$11 @ \$12 for Machinery Scrap; \$11 @ \$12 for Wrought Turnings; \$8 for Cast Borings, and nominally \$22 for Old Fish Plates, and \$13 @ \$14 for Old Car Wheels.

**Wrought-Iron Pipe.**—The market is dull and weak for large orders, but for small lots prices are pretty well maintained, as follows: Butt, Black, 55 %; Butt, Galvanized, 47½ %; Lap, Black, 65 %; Lap, Galvanized, 55 %; Boiler Tubes, 65 % all sizes new list; Casing, 62½ % new list.

Chas. K. Barns & Co. have added Coal and Coke as a branch of their business, in furtherance of which they have secured the services of Mr. W. G. Powell, who is well and favorably known in the trade, having been active as a shipper of Bituminous Coal and Coke for the past 20 years, and is well informed as to the needs of consumers and the requirements of the trade.

## Cleveland.

CLEVELAND, OHIO, January 23, 1893

**Iron Ore.**—The call from the furnaces has been a little heavier during the past week, about 22,000 tons of ore having been sent forward from the local docks. The better feeling in the Pig Iron situation, noted below, is of too recent occurrence to have any effect upon the Iron Ore market. The latter is being watched with extreme care by Iron men everywhere, and opening prices for '93 Ore will interest all branches of the Iron trade. Only a small amount of ore was sold during the past week, a few non-Bessemer Hematites being picked up at \$3 to fill out stocks. An indication that the railroad interests would require considerable Iron this year would hasten the opening of the market and would assist in fixing quotations for the Ore to be brought down in 1893.

**Pig Iron.**—Although the market is not active business is a little better. The demand is certainly improving and it is claimed that prices are as low as they are likely to go. Several big sales are pending and dealers assert that an improvement over prevailing quotations is more probable than a decline. Sales of Bessemer, in small lots, at \$13.55 @ \$13.60 are reported, while Gray Forge is in some demand at \$12.25 @ \$12.50. Foundry Irons are now so low that Southern Irons are in less demand than formerly by local buyers. That the market has taken a favorable turn is apparent in local financial centers, where money is reported to be easier than for some months past.

**Muck Bars.**—Several sales are reported at \$24 @ \$24.25, delivered, and the market is in better condition than for several weeks past.

**Old Rails.**—The demand is fair and quotations are quite firm at \$20 @ \$20.50 ¢ ton for Old Americans.

**Nails.**—Only a small amount of business is reported and prices are no better.

**Scrap.**—Some improvement is noted in the market, especially for No. 1 Railroad Wrought and Wrought-Iron Turnings. A lot of Railroad Wrought was sold during the past week at \$15.75 @ \$16, Cleveland, and of Wrought-Iron Turnings at \$10.50 @ \$10.75.

**Old Axles.**—The demand is fair and we hear of a sale at \$20.75, net ton.

**Freight.**—In view of the strained conditions of the Pig Iron and Iron Ore market the fluctuations in freight rates for the next few weeks will be watched with interest. Present quotations are: Pig Iron: Valley points to Cleveland, 60¢ ¢ ton; to Pittsburgh, 60¢. Muck Bar, Blooms, Billets, Scrap, Iron and Steel Rails, Old Wheels, &c.: Valley points to Cleveland, 70¢ ¢ ton; to Pittsburgh, 75¢ ¢ ton; to Boston, \$3.10 ¢ ton; to New York, \$2.70 ¢ ton; to Philadelphia, \$2.10 ¢ ton; to Newark, \$2.50 ¢ ton.

Tod, Stambaugh & Co. of this city have been appointed the Cleveland agents of the Sloss (Southern) Iron.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, January 25, 1893.

The Pig Iron trade has fallen back to a current consumptive order trade. There having been no large buying for forward delivery during the week, but there is evidently some enlargement in the order demand, which more frequently runs to several carloads instead of being restricted to one, and there are inquiries for larger lots, which may culminate in a much larger business in the early future. On the other hand some factors claim that the market looks weak, but whether this is so or not there is little doubt that melters of Pig Iron must have increased supplies early in the spring, and they do not seem to be at all confident that they will be able to obtain them at any material reduction in price. There is no doubt that the standard furnaces and Iron companies have confidence in the future, for they are refusing to entertain any bids which are not at full prices. There is a pretty general consensus of opinion among the Southern furnaces that they cannot afford to sell Iron at any lower prices, but they do not manifest great confidence that they will be able to establish an advance in the early future, unless something should occur to enlarge the demand for Steel Rails that would quickly increase the demand for Pig Iron.

## Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., under date of January 23, 1893, write: The activity which we mentioned in our last report has continued, and extended not only to Lake Superior but to Southern Charcoal Iron. Added to this, there has been a fair business in Southern Coke Irons. For the first time in a long while, Northern Coke Iron seems to be on a fair footing to compete in this market with their Southern neighbors. We mean on the same grades of metal, and while Southern Forge will continue here, the Northern makers not being able to reach the price, we think on the higher grades of Foundry Iron a larger business will be seen from the Northern furnaces than has existed for some time past. There are under treaty at the present time one or two large orders for Southern Foundry



Iron, which will unquestionably be consummated within the present week. The market generally is active, and strong in some directions, the weakness being seen in certain brands of Southern Coke Iron.

On Manufactured Iron, prices went off, and one or two contracts were booked at very low figures at the mill.

We repeat quotations of a week ago, which are as follows:

Lake Superior Charcoal, all numbers.....	\$16.50 @ \$17.00
Lake Superior Coke, Bessemer....	15.00 @ 15.50
Lake Superior Coke, Foundry, all ore.....	16.25 @ 16.75
Standard Ohio Blackband (40 per cent).....	16.00 @ 16.50
Southern No. 1.....	14.50 @ 15.00
Southern Gray Forge.....	12.50 @ 13.00
Jackson County (Ohio) Silvery.....	17.50 @ 18.00

## Louisville.

January 24, 1893

There is a fair amount of buying on the part of consumers who delayed until the beginning of the new year before purchasing. The buying covers all grades, and the movement is general and shows that they have confidence in present prices and are willing to contract for their demands during the next six months on basis of \$9.50 for No. 2 Foundry at furnace. There is very little complaint on the part of consumers of lack of orders, and they are looking forward with confidence to the business of the coming year. There has been no change in Car Wheel Irons and but few sales. Old Wheels are low, the ruling price being \$14. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry....	\$13.25 @ \$13.50
Southern Coke, No. 2 Foundry....	12.00 @ 12.25
Southern Coke, No. 3 Foundry....	11.50 @ 11.75
Southern Coke, Gray Forge.....	11.25 @ 11.50
Southern Charcoal, No. 1 Foundry	15.00 @ 16.00
Southern Car Wheel.....	17.50 @ 17.75

## New York.

Office of *The Iron Age*, 96-102 Reade street, }  
NEW YORK, January 25, 1893. }

**Pig Iron.**—Dullness continues to characterize this market, with evidence cropping up in adjacent territory that some sellers, both Northern and Southern, are making concessions to secure business. We quote Northern brands at \$14.75 @ \$15.25 for No. 1; \$14 @ \$14.50 for No. 2; \$13 @ \$13.50 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.75 @ \$15 for No. 1; \$13.75 @ \$14 for No. 2 and No. 1 Soft; \$13.25 @ \$13.50 for No. 2 Soft; \$12.75 @ \$13 for Gray Forge.

**Spiegeleisen and Ferromanganese.**—In Spiegeleisen there has been a sale of several thousand tons of 20 % at private terms, special freight arrangements having made a close price possible. The week has been very active in Ferromanganese, a relatively large amount of business having been closed in foreign material. In some cases buyers' offers have been refused, however. We quote 20 % Spiegeleisen nominally \$25.50 @ \$26, and Ferromanganese \$56.50 @ \$57.

**Billets and Rods.**—The market has been quiet, although there have been sales of round blocks to a New Jersey Wire mill at \$24, delivered, the seller being an Eastern Pennsylvania works. Practically nothing is doing in Wire Rods, domestic or foreign. We quote Steel Billets, tidewater, \$24.25 @ \$24.75; foreign, \$29.25 @ \$30; Wire Rods, \$32.50 @ \$33; foreign Wire Rods, \$40 @ \$40.50, and Swedish Rods, \$54.50 @ \$56.

**Steel Rails.**—The market is quiet, no sales of any magnitude having been reported by American mills during to last week. One of the points which are holding back transactions is that the railroads demand terms of payment unusually oner-

ous. We continue to quote \$29 at mill or at tidewater, according to location of works.

**Manufactured Iron and Steel.**—The movement is improving, quite a number of contracts having been placed during the week. The impression is gaining ground that the volume of business will be very heavy. Among the transactions of interest the principal one is the closing of the contract for the Rochester Pipe line, which was taken by Whitmore, Rauber & Vicinus for \$1,349,425. Although the city authorities were willing to pay some additional price for Cast-Iron Pipe, the difference in the bids between Cast and Steel were so far apart that Iron Pipe was selected. This would involve about 9000 tons of Plates. During the week a Central Pennsylvania mill has taken a 500-ton contract of elevated work in this city at a figure which it is reported is lower than any recorded thus far even on the heaviest transactions. A leading Pittsburgh works has secured the Plates for the Bath steamer, the quantity involved being about 400 tons of Ship Plates, 200 tons Marine Plates and 200 tons of Structural Material. For this also low prices were named. In the Architectural line we note the placing of Beams and material for a warehouse in Brooklyn. The contract has also been placed for an exceptionally large gas tank, calling for about 1000 tons of material, including over 600 tons of Plates. It is evident that a good many of the mills are making exceptionally low prices in order to secure immediate specifications, some of the quotations being the lowest on record for this market. We quote Beams at 2.25¢ @ 2.75¢ for small lots and 1.95¢ @ 2.25¢ for round lots, according to sizes; Angles, 1.85¢ @ 2¢; Sheared Plates, 1.85¢ @ 2.10¢; Tees, 2.10¢ @ 2.30¢; Channels, 2.10¢ @ 2.20¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.85¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.5¢ @ 2.75¢ for Marine, and 2.60¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.65¢ @ 1.9¢, on dock; Common, 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.90¢ @ 2.1¢, and Links and Pins, 2¢ @ 2.20¢; Steel Hoops, 1.90¢ @ 2¢, delivered.

**Track Material.**—We quote Spikes, 1.90¢ @ 2¢; Fish Plates, 1.60¢ @ 1.65¢; Track Bolts, square nuts, 2.40¢ @ 2.60¢, and hexagon nuts, 2.70¢ @ 2.80¢, delivered.

The office of W. H. Edgerly, agent of the Lukens Iron & Steel Company, manufacturers of Plates, has been removed to Room 193, Columbia Building, 29 Broadway.

## Boston.

Office of *The Iron Age*, 146 Franklin St., }  
BOSTON, January 24, 1893. }

**Pig Iron.**—The market here is rather quiet. Still the foundries are all busy, but they are using iron bought some time ago, or else are buying in just as small lots as they can get along with. They seem to expect lower prices, and consequently do not desire to buy any faster than they are obliged to. But there is pretty sure to be a good volume of trade as soon as the question of values is settled. Quotations on Southern Iron are at: No. 1, \$15 @ \$16; No. 2, \$14.15; No. 3, \$13.50 @ \$14. These prices are for Southern Iron delivered in Boston. Pennsylvania Iron, at shipping port is quoted at: No. 1, \$15; No. 2, \$14; Gray Forge, \$13.50. Small lots on the market here would cost more by the amount of freight and other charges. Western Irons, delivered at Boston points, are quotable at \$17.50 @ \$19.

**Bar Iron.**—There is a slightly firmer tendency in Bars. Some of the consumers will not have Steel, in spite of the fact that so many of the large rolling mills at Pittsburgh and other points are making Steel only, and this has given the one or two rolling mills left in New England a very good business, and they can come nearer to dictating terms than for a long time. The Wareham, Mass., mills are so full of orders as to be declining quick deliveries, and such orders as are not particularly favorable in price. The market on Bars is quotable at: Ordinary refined Bars, from mill, 1.70¢ @ 1.80¢; from store, 1.80¢ @ 1.85¢. The best Bars, from Puddled Iron, 1.95¢ @ 2.10¢ from mill and at 2.10¢ @ 2.25¢ from store.

**Building and Bridge Iron.**—There is a good request for Building Iron, especially in a large way, and a good many contracts are being placed. Bullard & Post have just made a contract to furnish the H. F. Hawkins Iron Works, at Springfield, with between 200 and 300 tons of Iron—or rather it was nearly all steel—for a double bridge over the Boston & Albany and New York & New England tracks at Armory street. The Boston Bridge Works Company have just completed a contract for some 150 tons of Iron and Steel for buildings, a pulp digester and boilers and a boiler house at Rumford Falls. The same company placed about a month ago a big contract for some 1500 tons of Iron and Steel with the Brooklyn, N. Y., City Railway. The material is for a big power house and plant. The quotations on Building Iron are: Beams and Channels, 2¢ @ 2.20¢; Angles, 2¢; Tees, 2.40¢ @ 2½¢.

**Steel and Steel Rails.**—The tendency in steel is easy, though at the present rate of business the big concerns will soon get pretty fully of orders and then they will begin putting up prices. The big contract for steamer materials at Bath, Maine, went to the Carnegies, after all, but at very low prices, it is whispered. The other bidders all came back from Bath together and they claim that the contract was placed at remarkably low prices, and they have a chance to know. The entire contract, Plates, Boiler Plates and Marine Steel, involved some 1200 tons of materials. But it is now mentioned that the Carnegies are getting a full supply of orders in some departments and are already putting up prices. The quotations on Steel are nominally unchanged here. The announcement by the mills that the prices of Steel Rails, at mill, is \$29 has not seemed to induce buying yet by the New England roads, beyond what has already been mentioned. Perhaps it is too early to expect orders. It is certain, however, that the chances for Rails have seldom looked better in this section of the country than to-day. There are more miles of roads under contract and construction in Maine than for some years, while the Legislature of that State has a grist of charters to grind out longer than has ever been before presented. These charters are largely for electric roads, however. Rails ought to be in good demand later, but the railway companies to-day are looking for still lower prices.

**Pipe and Fittings.**—There is a good winter trade in Pipe and Fittings, with some good water works contracts in sight, but not yet placed. Prices are steady, and the dealers are cheerful.

**Old Iron.**—The market on old Iron is very quiet. The trouble is the want of a sufficient number of buyers. Gradually the former users of Scrap Iron are working out of it. Quotations are nominally at: No. 1 Wrought, 50¢ @ 55¢; No. 100; old Horseshoes, 60¢; light Iron, 30¢ @ 40¢; machine shop Scrap, 25¢ @ 30¢ for Cast, and 30¢ @ 35¢ for Wrought.

## Metal Market.

**Copper.**—Business has been almost at a standstill during the week under review, and nothing has transpired in the way of new demand or offering calculated to enliven the market. In other words, home trade buying is still extremely conservative, export demand for both fine Copper and Furnace Material drags somewhat wearily, and evidence is not wanting that the "agreement between gentlemen" has thus far failed to bring about desired results, although still looked upon as an effective agency in preventing demoralization of the market. From second hands small lots of Lake Superior Ingot are still offered at 12.10¢ @ 12½¢, prompt and near future delivery, and there is a vague possibility that some of the smaller producers would sell in a limited way at about the same figures. Still 12½¢ stands as the popular asking price, and efforts in the direction of securing orders at 12¢ are still unrewarded. There has been merely routine demand for casting brands, and while small quantities might be secured at less, 11½¢ is quoted as being a close price for round lots. European advices indicate that consumption thus far this year has been somewhat disappointing, there as well as on this side of the Atlantic and that conservative policy on the part of consumers still acts as an offset to the restriction of output here and abroad.

**Pig Tin.**—The speculative interest has again played the game with which dealers and consumers have become somewhat familiar latterly, moving prices around somewhat here and in London, yet accomplishing nothing that would throw light upon interior workings or motives. The matter of American tariff seems to have lost force as a cue to operations, temporarily at least, and the strongest points in the statistical position are less effective than they were a short time ago. In fact, it looks very much as though the manipulations of the leading foreign speculators still govern prices in a great degree. Prompt and near future deliveries sold at as high as 20.30¢, net cash, but subsequently dropped to 20.10¢, and have since reacted to a moderate extent only. Ordinary jobbing parcels have been dealt out at corresponding prices. The movement of stock into the channels of consumption has, to all accounts, been somewhat above the January average thus far.

**Pig Lead.**—A very few hundred tons will cover the record of sales for the week under review, the bulk of which were at 3.85¢ @ 3¾¢, delivered here. Demand is slow at the moment and not without evidence that leading consumers are practically a unit in avoiding competitive buying likely to give producers any decided advantage. Latest accounts go to show that the January output at leading points has been moderate, however, and that fact alone serves to keep prices firm. At this writing there are buyers at 3.85¢ and few, if any, sellers at less than 3.90¢ for current month or February delivery.

**Spelter.**—There is no perceptible improvement in the Eastern demand and offerings from the primary sources of supply indicate that the buying elsewhere is on a moderate scale. Production is going ahead on a liberal scale, and the offering of surplus supplies continues sufficient to keep prices rather weak. Prime Western brands are offered at 4.35¢ in the East for January to March shipment, and quotations have been made as low as 4¢, f.o.b., East St. Louis.

**Antimony.**—There has been some pressure to sell, under which prices were forced below 10½¢ for Cookson's, but weak lots are now practically all out of the way, and the market is steadier with holders quot-

ing 10½¢ for Hallett's, 10¾¢ @ 10½¢ for L. X. and 10¾¢ @ 10½¢ for Cookson's.

**Tin Plate.**—Very fair sales have been made of spot goods. In some instances the prices were in line with those that have been quoted for some time past, but concessions have not been purely exceptional, and the market is at present looking a trifle weak. Future deliveries have been taken hold of in an indifferent way and prices for these, as well as for prompts, are a trifle easy, although without decided change. We quote as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, \$5.85; light weights, \$5.10 for 100 lb., \$4.95 for 95-lb., \$4.80 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.85. IC Charcoals—Melyn grade, ¼ X assortment, \$6.40; Crosses, \$8; Allaway grade, any assortment, \$5.70; Crosses, \$7; Grange grade, any assortment, \$5.80; Crosses, \$7.10. Charcoal Ternes—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.75; do., 20 x 28, \$13.50; Dean grade, 14 x 20, \$5.30 @ \$5.35; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.25; do., 20 x 28, \$10.50; Dyffryn, 14 x 20, \$5.50; do., 20 x 28, scarce. Wasters—S. T. P. grade, 14 x 20, \$5; do., 20 x 28, \$9.75; Abercarne grade, 14 x 20, \$4.95; do., 20 x 28, \$9.62½.

## Financial.

The transportation of merchandise has been much interrupted by the ice embargo, but bank clearances do not indicate a decline in the aggregate of business transactions, partly due, no doubt, to the recent renewed activity in stock speculation, although clearances outside of New York have surpassed those for the corresponding period last year, which was the largest on record. During the past week, aside from weather conditions, there were no distinctly unfortunate occurrences affecting trade, unless we except the renewed shipments of gold on a large scale, amounting to \$4,300,000.

The previous announcement that the Bank of France no longer allowed a premium on gold was followed by the statement that the bank had obtained permission to increase its circulation 500,000,000 francs and therefore rescinded its action. This circumstance attracted less attention from the fact that since early in the year the banks have received extraordinary accessions of money from the interior—equal to a gain of nearly \$7,500,000 during the week ending January 19. The United States Treasury, meanwhile, is not disturbed, the loss of gold since January 1 having been only \$1,612,000. The prospects of the Sherman silver law are viewed with less apprehension in confidence that remedial legislation will soon be adopted.

Apropos of the silver question is the annual statement of the production of silver mines in the United States and Mexico, as given in the Wells-Fargo report. According to this authority the mines in the country in 1892 produced in value only \$50,607,501, against \$60,614,004 in 1891. It is also shown that Mexico produced last year 56,480,000 ounces, or an excess of about \$10,000,000 compared with 1891. It is therefore calculated that, altogether, the quantity produced was about 118,950,000 ounces, or not far from 6,000,000 ounces more than in 1891—serving to indicate that the decline in value that has taken place is only in obedience to the law of supply and demand.

The stock market was active and prices touched in several instances the highest point reached for more than a year. St. Paul from 79½ advanced to 82½, with large dealings, and in Distilling and Cattle Feed-

ing transactions were very heavy, though at irregular prices. Good buying in London was noticed. A report that a special session of Congress would be called in the event of a failure to repeal the silver law caused an advance at the close. Reading was active and irregular, but higher than it was a week ago.

The abundance of money is reflected in the weekly statement of the Associated Banks, there being an average gain in cash of \$11,192,500. The result of all the changes was a gain in the surplus reserve of \$6,919,150, and the banks now hold in excess of legal requirements \$22,529,600, against \$33,002,900 in the corresponding week a year ago, and \$24,089,775 in the preceding year. Loans were expanded over \$7,000,000.

In the merchandise markets there is no special change. Cotton declined a fraction, but recovered. Wheat was nearly 2¢ lower, Western receipts continuing large. Exports in three weeks from both coasts have been 9,954,607 bushels, flour included, against 14,026,840 bushels for the same weeks last year. *Bradstreet's* calculates that the quantity remaining in farmers' hands March 1 will be 104,000,000 bushels, and the stock now in sight in this country is 99,631,000 bushels, against 64,085,000 at that date last year.

## British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, January 25, 1893.

The squeeze in Scotch warrants has continued, and operators who were on the wrong side have had to pay as 44/3 for prompts to meet maturing obligations. No outside interest has developed, since there is general lack of confidence in the endurance of the advance, while the fact that three months futures are offered at 1/3 less than prompts is not without restraining influence. In view of the fact that makers' prices remain almost stationary, the opinion obtains that the rise in cash warrants is due solely to speculative manipulation and no gauge of the market, consumptive demand being moderate. Cleveland warrants have dropped to 35/3, and the market is weak under the influence of light demand and accumulation of stocks at furnaces. Hematite warrants have receded to 45/9 and are almost neglected at the decline. Stocks in public stores now include 336,000 tons Scotch and 30,390 tons Cleveland.

Pig Tin prices moved up to as high as £93. 2/6 @ £93. 5/ under the influence of improved demand from the United States and higher rates of Eastern exchange. At the advance more spot stock was offered, with the result of weakening prices somewhat, but forward deliveries have been in better demand and relatively stronger.

The Copper market has been quiet throughout the week. There is very little speculative buying interest, and purchases by consumers are still of exceedingly conservative type. Outside speculation has been confined chiefly to realizations by tired holders.

Tin-Plate market has not changed for the better. American business in particular is still dragging. Some inquiries for fair lots of special sizes are making

and a little is doing in ordinary sizes; but, owing to disparity between buyers' and makers' views on prices, the volume of business is moderate.

Steel prospects continue poor. All rails at Barrow are at a standstill except those working on old contracts for Rails. The demand generally is very slow.

**Scotch Pig Iron.**—Makers hold firmly for previous prices, but sales are slow and the demand still moderate.

No. 1 Coltness, f.o.b. Glasgow.....	54 6
No. 1 Summerlee, " ".....	51/
No. 1 Gartsherrie, " ".....	51/6
No. 1 Langloan, " ".....	53/
No. 1 Carnbroe, " ".....	44/9
No. 1 Shotts, " at Leith.....	53/
No. 1 Glengarnock, " Ardrossan.....	49/6
No. 1 Dalmellington, " ".....	47 6
No. 1 Eglinton, " ".....	46/3

Steamer freights, Glasgow to New York, 1/; Liverpool to New York, 7/6.

**Cleveland Pig.**—Demand continues light and the market is weak, with makers offering at 35/6, f.o.b. shipping port, for No. 3 Middlesborough.

**Bessemer Pig.**—Warrants a little firmer at the close, but makers' Iron is slow at last week's prices. Makers offer at 47/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

**Ferromanganese.**—There is very little doing and prices are still rather weak. English 80% quoted at £11. 11/3, f.o.b. shipping port.

**Steel Rails.**—Business moderate and prices soft but showing no radical change. Heavy sections quoted at £4, f.o.b. shipping port.

**Steel Slabs.**—Very dull market and prices without change. Bessemer quoted at £4, f.o.b. at shipping point.

**Steel Billets.**—Orders are chiefly for small lots and prices continue easy. Bessemer, 2½ x 2½ inches, quoted at £4, f.o.b. shipping point.

**Steel Blooms.**—The market remained very quiet. Makers quote £4 for 7 x 7, f.o.b. shipping point.

**Old Iron Rails.**—No further change in prices and the market dull. Tees quoted at £2. 7/6 @ £2. 10/ and Double Heads at £2. 10/ @ £2. 12/6, f.o.b.

**Scrap Iron.**—Demand moderate and prices still easy. Heavy Wrought Iron quoted at £1. 17/6 @ £2, f.o.b.

**Crop Ends.**—Very moderate; business at old prices. Bessemer quoted at £2. 7/6 @ £2. 10/, f.o.b.

**Manufactured Iron.**—Orders still run light and prices favor the buyer somewhat. We quote, f.o.b. Liverpool:

Staff. Ordinary Marked Bars	8 0 0	@	£ s. d.
Common " "	6 7 6	@	6 10 0
Staff. Bl'k Sheet, singles.....	7 10 0	@	7 10 0
Welsh Bars (f.o.b. Wales).....	5 7 6	@	5 10 0

**Tin Plate.**—There was rather more demand at the close but no turn in prices. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	13/6 @ 13/9
IC Bessemer Steel, Coke finish.....	12/0 @ 12/3
IC Siemens " ".....	12/3 @ 12/6
IC Coke, B. V. grade 14 x 20.....	12/0 @ 12/3
Charcoal Terne, Dean grade.....	11/9 @ 12/

**Pig Tin.**—Market firmer at the close but quiet. Straits quoted at £92.15/ @ £92. 17/6 for spot and £93. @ £93. 2/6 for three months' futures.

**Copper.**—Slow market at the close, with prices easy. Merchant Bars quoted

at £45. 10/, spot, and £46. @ £46. 5/ three months' futures. Best selected, £50.

**Lead.**—There has been more doing, and the market is steadier at £9. 17/6 for Soft Spanish.

**Spelter.**—Business moderate, but prices steady at £18 for ordinary Silesian.

## The German Iron Trade.

(One mark per metric ton is equivalent to 24.8 cents per gross ton.)

DUSSELDORF, January 7, 1893.

The Coal markets are controlled by the strike in the Saar District. Out of 29,937 men 24,000 stopped work. The engine-men continued and some of the workmen have resumed. The average wages for the 16,000 miners was 4.55 marks, while the average for the total of 30,000 men, including trammers and boys, was 3.90 marks. These wages have been characterized by the workmen as starvation wages. Some of the Iron Works in the Saar District have large stocks, others have covered from Belgium mines and from the Ruhr District, so that work continues.

The Iron and Steel Works complain of a continued lack of orders. The stoppage of work at the Marcotty Plate Mill at Duisburg has been followed by the closing down of the Binsal works. There have been some dismissals of workmen and reductions of wages. Thus the Osnabruck Steel Works have announced a reduction in wages of 25 per cent. In spite of the fact that prices are very low, they continue to decline, this applying both to Pig Iron and to finished Iron and Steel. The best Siegen high-grade Forge Iron has been sold at 42 marks and 1½ % discount per ton. The Iron industry hopes to secure larger exports to Switzerland in consequence of the contest of tariffs between France and Switzerland.

The Gutehoffnungshuette, at Oberhausen, for 149,000 florins, while the Angleur sen, entered a bid for a lockgate at Hillau Steel Works were next lowest bidders with 185,000 florins.

In 1892 the German Navy launched nine large ships and an equal number of torpedo boats. It is hoped that in the course of the present year two additional vessels of first rank will be completed.

## St. Louis.

Office of The Iron Age,  
Bank of Commerce Building,  
St. Louis, January 23, 1893.

**Pig Iron.**—During the past week the market has not undergone any distinctive change, and yet there is a general feeling of confidence which was totally absent during the closing weeks of last year and the early part of this. The improvement noted refers more particularly to good Irons, or Irons which have been on the market for years and have a reputation established which is considered of some value. With this class of Iron prices are much firmer, and the disposition among furnacemen making them is to adhere firmly to prices. As is always the case, there are a number of Irons described as being a trifle "off" which are being offered at prices a trifle under the market. These are growing fewer, however, and indications point to a time in the near future when their influence will not be felt, at least not to the extent that it has been. The market is, statistically, in excellent condition, and inquiries in hand indicate a good demand from now on. Consumers are all busy, with the possible exception of the stove men, who are not running full time just now, but outside of this particular line the establishments using Pig Iron are all

kept well employed. Sales during the week under review were not individually large, but in the aggregate footed up a good week's business. For ordinary quantities we quote as follows, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry.....	\$14.25 @ \$14.50
Southern Coke, No. 2 Foundry.....	13.00 @ 13.50
Southern Coke, No. 3 Foundry.....	12.50 @ 12.75
Southern Gray Forge.....	12.00 @ 12.25
Southern Car Wheel.....	18.25 @ 18.75
Lake Superior Car Wheel.....	18.00 @ 18.50
Ohio Softeners.....	16.25 @ 17.00
Missouri Charcoal, No. 1 Foundry.....	14.25 @ 15.00

**Bar Iron.**—The demand for Bar Iron is still light, and prices, while they do not improve any, are not quotably lower. Mills refuse to shade 1.60¢ even for good specifications, and jobbers ask 1.80¢ for lots from store, which price is well maintained. Car manufacturers have all the work they can handle, but at the same time seem to be well supplied with Bar Iron. The demand is expected to improve shortly, and prices will doubtless advance at the same time.

**Barb Wire.**—Trade during the past week has been light, and prices fail to improve. All eyes have been centered on the meeting of manufacturers held in Chicago last week. At this writing we have nothing definite, although matters are likely to be arranged at any moment. Painted is quoted at \$2.15 for carload quantities from mill to jobbers; Galvanized \$2.60. Jobbers report some little trade, but nothing in the way of large orders.

**Wire Nails.**—The low price of Wire Nails has induced some buying by large jobbers for spring demand, for there is not much in the way of orders for immediate delivery. Prices are low, and it does not seem reasonable to suppose that they will go lower. Carload quantities are quoted from mill at \$1.55 @ \$1.60 in carload lots to jobbers. Jobbers ask \$1.70 @ \$1.75, according to quantity.

### Freight Rates.

Pig Iron	Per ton.
Birmingham, Ala., to St. Louis.....	\$3.25
Chattanooga, Tenn., to St. Louis.....	3.00
Sheffield, Ala., to St. Louis.....	2.80

Barb Wire and Wire Nails.	Per cwt.
Pittsburgh, Pa., to St. Louis.....	22¢
Cleveland, Ohio, to St. Louis.....	18¢
Anderson, Ohio, to St. Louis.....	14¢

(By Telegraph, January 25.)

**Pig Lead.**—The market is quiet at 3.60¢, at which price sales are made. During the past week the market has shown additional firmness and consumers will find it difficult to secure anything lower than the above mentioned price.

**Spelter.**—Dullness is the chief characteristic of this department. Sales are limited to carlots for immediate shipment. We are advised that 4.05¢ is an open quotation for good sized lots and 4.07½¢ is paid for single car lots. The market is weak at 4.05¢, however, and a lower market is among the probabilities.

The Woodward Iron Company, Woodward, Ala., will hereafter be represented in St. Louis by H. H. Combs.

The dipping room of the St. Louis works of the Consolidated Steel & Wire Company was destroyed by fire on the morning of the 21st inst. The loss will amount to about \$1000. The building will be repaired and ready for occupancy in the course of a few days.

M. Eiffel, the great engineer, appears to have received 69,000,000 francs for doing 36,000,000 francs' worth of work for the Panama Canal Company. His prices, a wicked contemporary says, seem to have been made on the same scale as his tower.

**Mahoning and Shenango Valleys.**

The Ohio Steel Company of Youngstown have placed orders for engines and machinery for their new steel plant with Wm. Tod & Co., and it is expected that as soon as the weather permits, the work of constructing the additional departments will be pursued. Wm. Tod & Co. are building the Ferris observation wheel for the World's Fair, which was designed by Julian Kennedy of Pittsburgh. The wheel will be 256 feet in diameter, and will be driven by a pair of 30 x 48 inch Porter-Hamilton engines.

The Lloyd Booth Company of Youngstown have completed the machinery and equipment for the tin plant of the Falcon Iron & Nail Company Niles. They are now building a 126 inch knife squaring shear for the Etna Iron & Steel Company of Bridgeport, Ohio, also a 9-inch guide train for the Minneapolis rolling mill, also a pair of power cranes, 30 tons each.

It is reported that Mr. W. Scott Bonnell, brother of Henry O. Bonnell, deceased, will fill the position of president of the Mahoning Valley Iron Company and president of the Mahoning National Bank. Joseph G. Butler, Jr., of Youngstown, will act as president of the Mahoning and Shenango Iron Manufacturers' Association, vice H. O. Bonnell, deceased. Mr. Butler has been vice-president of the association for the past four years.

The Sharon Chain Works of Sharon, Pa., which has been idle for the past year, resumed operations last week and has large orders ahead.

It is stated upon good authority that Youngstown is to have a patent buckle factory in the near future.

The Neracher-Hill Sprinkler Company of Warren, Ohio, recently entered into the consolidation of fire-extinguisher companies, now known as the General Fire Extinguisher Company of New York, with a capital of \$2,000,000.

The Shenango Valley Steel Works of New Castle, Pa., will be enlarged during the coming year. The company have already ordered new pumps, boilers and other machinery.

The Morgan Engineering Company, Alliance, have shipped to the World's Fair a mammoth crane operated by electric motors of the Thomson-Houston make, designed by W. H. Morgan. It is a marvel of mechanical skill. The crane will lift 30 tons with ease, and will travel the entire length of Machinery Hall, a distance of 1300 feet. On top of the girders is a platform for passengers to ride from one end of the building to the other and view the machinery beneath them. To reach the platform, there will be an elevator at each end of the building. The Morgan Engineering Company have built over 600 of these cranes. An idea of the size of one of them may be gained from knowing that 12 railroad cars are required to carry it.

The new blowing engine at the Girard furnace has been completed and is now in operation.

The Sharon Iron Company, Sharon, Pa., have ordered three 22 inch sheet mills and one 24-inch cold rolling mill from the Lloyd Booth Company, Youngstown. The latter company are also making a large squaring shear for the Wallace Banfield Company of Irondale, Ohio.

The iron manufacturers of Youngstown are neither surprised nor disappointed at the deal being off for the purchase of the iron and steel properties by a New York syndicate. So many efforts of this kind have been made and have come to naught that the iron men have about concluded to lose no further time with such scheming syndicates.

The Youngston Car Works are kept busy repairing cars and filling small orders.

Failure to secure brick has delayed the

repairs at the Warren Tube Works, but the whole plant will be in operation inside of two weeks.

Several of the mills in the valleys have experienced much difficulty in securing sufficient coal supply during the recent cold snap and heavy snows.

The Lloyd Booth Company are about to erect an addition to their foundry department 80 x 100 feet, which will be fitted out with modern machinery and improvements, two steam cranes, one 30 tons, the other 20 tons.

Quite a number of the mills in the Mahoning Valley have been closed down for the past two weeks owing to lack of orders, but all are running again this week.

Notices have been posted in the Beaver Falls mills of the Carnegie Steel Company, Limited, at Beaver Falls, Pa., that hereafter 5 cents per week will be deducted from the pay of each employee, the money so deducted to go into a fund to provide relief benefits for employees injured while at their work in the mills. Any employee injured in the pursuit of his calling will have his doctor's bills paid from this fund, and will be given \$3 for the first week he may be unable to work because of such injury, and \$5 for each week thereafter, for a term not exceeding 13 weeks. In case of death by accident while at his work, the funeral expenses will also be paid from this fund. It meets with general favor among the men.

The output of the Colorado Fuel & Iron Company for the year was as follows: Lump, 1,435,739; nut, 140,877; slack, 290,117; total, 1,906,724; coke, 254,776. The coal industry of Colorado for two years makes the following showing:

	1891.	1892.
Productions in tons	\$3,512,632	\$3,771,234
Total value.....	5,901,221	5,222,536
Av. number of persons employed...	6,822	6,578
Wages paid per ton	78¢	75¢

Boston is already calculating with much confidence on that port becoming the terminus of an important trade over the Canadian Pacific, as well as the Reading system of roads, as negotiations respecting the ownership of a large tract on the water front are pending. The building of such terminals would, of course, mean the running of many additional ocean steamers from that port.

The Canadian Government, in its announcement of canal tolls adopted for the year 1893, puts an end to all discrimination against vessels, merchandise or citizens of the United States.

The grain business of New York for 1892, as shown by the official statistics of the New York Produce Exchange, has grown to unprecedented proportions. The receipts of flour increased 1,600,000 barrels over 1891 and the exports were 1,700,000 barrels. Wheat receipts increased 2,500,000 bushels, and the exports were 3,200,000 bushels, the heaviest recorded. The receipts of corn increased over 3,000,000 bushels, but were far below the aggregate for the years 1889 and 1890, while the exports of corn in 1892 were 7,000,000 bushels larger than for the previous year. A comparison of the trade in wheat and corn during the last six years is as follows:

	Receipts.		Exports.	
1892.....	63,582,260	27,879,821	49,789,403	18,279,578
1891.....	61,006,851	24,342,094	46,514,096	12,819,911
1890.....	15,794,857	34,281,466	12,549,946	24,550,165
1889.....	15,973,253	35,547,467	10,916,604	28,586,818
1888.....	20,104,435	24,150,535	12,609,242	14,509,961
1887.....	45,222,425	20,231,422	41,885,969	12,299,410

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# HARDWARE.

## Condition of Trade.

**T**HE WEEK'S business shows a marked improvement over that of the preceding one, and it is obvious that trade is beginning to move with more freedom, though it is unquestionably restrained somewhat by the continuance of severe weather. The large houses are actively completing their preparations for the season's trade and getting their stocks in condition for the demands which will soon be made upon them. They are, however, purchasing carefully, there being an increasing disposition to order frequently, letting the manufacturers as far as possible carry the stocks. The prospect for business during the next few months is regarded as excellent. In the matter of prices there is little of importance to note. In some special lines slightly higher quotations are made, but on many staple goods the market is weak and prices are somewhat lower. In this state of things it is obviously the part of wisdom for large purchasers to watch the market closely, as it is likely that some of the staple goods which are exceptionally low may recover strength and somewhat higher prices prevail.

### Chicago.

(By Telegraph.)

The severity of the weather has seriously interfered with the movements of salesmen, but under the circumstances trade is better than might be expected, although it can hardly be called active. Orders are now being taken for future shipment of Wire Cloth, Poultry Netting, Screen Doors, Refrigerators, Steel Goods, &c., but there is some stocking up in the general line of Hardware by those who found their assortments broken after inventorying. Collections are a little better than they have been, as there is always a great deal of prodding done at the beginning of the year. The improvement, however, is only regarded as temporary, the prospects indicating a tighter money market as the year advances. Country bankers are complaining of the scarcity of funds, caused by the farmers still carrying a large part of their crops which they have been holding for higher prices. This is the most discouraging feature of the present situation. Heavy Hardware jobbers report a moderate volume of business the past week, with competition very keen on any business coming forward in Iron or Steel and consequent weakness in prices.

### St. Louis.

(By Telegraph.)

A peculiar feature of the Hardware trade is the unusually heavy demand at present prevailing. The month of Jan-

uary is not looked upon as one of the heavy months of the year, and yet the present month will show a record far in excess of last year. The local trade is particularly heavy, and the demand from this State for Wagon Stock, Traces, Harness, &c., is much above the average just now. There is an excellent demand for Hollow Ware; in fact, in some cases jobbers are unable to supply the demand. Wire Nails are beginning to interest the trade on account of the low prices at which they are offered. Builders' Hardware is dull and Cut Nails are not in much demand. Collections are excellent.

## Notes on Prices.

**Cut Nails.**—A good many inquiries are being made for quotations on Cut Nails and the volume of business is fair, though not especially heavy. The Eastern mills which have been shut down for a while are beginning to start up, but thus far there has not been any important accumulation of stock. Quotations remain without change on a basis of \$1.40 for carload lots at mill on a 35-cent average, and are slightly higher in the West, though it is understood that some of the Western mills have recently been making concessions on their former prices. Small lots from store in New York are held at \$1.75 to \$1.80, figures which are sometimes slightly shaded, and carload lots on dock on a 40-cent average are quoted at \$1.60. The question as to the advisability of revising the Nail card is being considered by the manufacturers, and on the 31st inst. a meeting of the representatives of the Eastern and Western mills will be held to discuss the subject and prepare a new card if the way is clear. There are, however, a good many diverse views, and it is not at all certain what the features of the new card will be in case it is decided to adopt one.

*Chicago, by Telegraph.*—Cut Steel Nails have been in somewhat better demand from factory, and for the time being trade is very steady, with very little pressure to sell by distant makers. Local manufacturers continue to quote \$1.60, Chicago, on 30-cent average, and jobbers sell small lots from stock at \$1.65 to \$1.70, according to average.

**Wire Nails.**—Manufacturers have no reason for complaint in regard to the volume of business, the aggregate of sales being large and inquiries indicating a disposition on the part of merchants to place orders. The margin of profit is, however, exceedingly narrow, if there be any profit at the low prices now ruling. Since our last report the market, instead of gaining strength, has receded slightly, and is characterized by some weakness and irregularity. The quotation for large lots at mill is \$1.35 to \$1.40, concessions from the

former figure having been made, but only in very exceptional cases. For less than carload lots an advance of 10 cents is quite generally insisted upon by the manufacturers, and merchants purchasing lots of this size can usually do as well from the jobbers. The conferences between the manufacturers of this and related lines continue, but without definite result thus far. Small lots from store in New York are quoted at \$1.75 to \$1.80.

*Chicago, by Telegraph.*—Manufacturers report a good trade in Wire Nails considering the season, but prices have latterly been demoralized on anything like a good quantity or a choice specification. Sales have been made in this way at \$1.50, Chicago, and it is broadly hinted that some manufacturers have gone even lower than this. They all claim that such prices are below cost, of which we have no doubt. The situation now promises to correct itself. Manufacturers are endeavoring to check the demoralization and several agents have received positive instructions to adhere to \$1.40, factory. They further think the chances are good of the manufacturers getting together and controlling prices, and meanwhile do not propose to fill up their order books with low contracts. Carload lots are quoted at \$1.60, and small lots from stock \$1.65 to \$1.70.

**Barb Wire.**—As the season advances there is more inquiry and some increase in the volume of business. Prices continue without change on a basis of \$2.40 for carload lots of Four-Point Galvanized at mill, a figure which, however, is not made by all the manufacturers. Small lots from store in New York are held at \$3.10 for Four-Point Galvanized, with 10 cents off for carloads.

*Chicago, by Telegraph.*—Only a moderate business is reported by manufacturers, who are endeavoring to hold trade up to \$2.20 and \$2.65 respectively for carload lots of Painted and Galvanized. Jobbers, however, are taking control of the trade at this time, as they are selling at \$2.15 and \$2.60, with 5 cents advance for small lots. The Joliet Enterprise Company's stock of Barb Wire was to be sold to the highest bidder this week, but so far no particulars have been made public as to the transaction. Whoever gets it will have a cheap lot of Painted Wire to put on the market.

**Lag Screws.**—Since the opening of the year the market for Lag Screws and similar goods has developed lower prices. Some of the manufacturers, however, refuse to meet the quotations made by some of their competitors and the market is thus quite uneven.

**Lawn Mowers.**—The Lawn Mower market is active, with a prospect of a large aggregate of business during the season. This is a line of goods for which there is a



constantly increasing demand, and in the production of which a number of new manufacturers are engaged. The result is very active competition and comparatively low prices on many of the machines. While the leading makers who have an established reputation are holding their trade there is a large demand for cheap Mowers, on which a wide range of prices prevails. The condition of the market is indicated by the fact that on low-grade Mowers such prices as the following are obtainable on good orders: 10-inch, \$2.50; 12-inch, \$2.75; 14-inch, \$3, &c. Other goods of better quality command, of course, higher prices.

**Nuts.**—Hot pressed Nuts are somewhat lower than they have been, as the weakness which has heretofore existed has been succeeded by slightly reduced quotations. The market is in an unsettled condition.

**Rivets and Burrs.**—The market for Iron Rivets and Burrs continues in a demoralized condition. Prices are low and irregular and do not as yet show indications of increased strength. A further weakness in this line has developed in a week or two.

**Cordage.**—The Rope market continues without important change since our last review, there being a fair amount of business notwithstanding the fact that buyers are not generally placing orders to cover their future requirements. The price of Manila is slightly lower and quoted as low as 9½ to 9¼ cents in large lots, f.o.b. New York or factory. Sisal and New Zealand remain substantially the same as before. Sisal is quoted at a base price of 7½ to 7¼ cents in small lots, and New Zealand at 6½ cents in small lots, large lots being subject to an abatement of ¼ to ½ cent per pound, f.o.b. New York or factory. Terms, 1½ per cent. discount for cash. The competition between the manufacturers continues very active. We are authorized by Travers Bros. Company to contradict the report that there have been recent negotiations looking toward the purchase of their Cordage interests by the National Cordage Company, a report which they state is without foundation. A similar contradiction is made in regard to John Good's Cordage interests.

**Faucets.**—The following revised quotations on the extensive line of Faucets manufactured by John Sommer's Son, Newark, N. J., will be of interest as representing the present prices:

	Per cent.
Peerless Best Block, Tin Key.....	40
IXL, first quality, Cork Lined.....	50
Diamond Lock Faucets.....	50
Perfection Fla. Red Cedar, in boxes.....	40
No Brand Red Cedar, in barrels.....	50&20
Reliable, Cork Lined.....	60
O. K. Western Pattern, Cork Lined.....	50
Western Pattern, Metal Key.....	40
Boss, Metal Key.....	50
No Brand, Metal Key.....	60

**Cross-Cut Saws.**—An effort is being made by some of the leading manufacturers of Cross-Cut Saws to discontinue the quotation and sale of these goods by the foot and to sell them by the piece. Lists are accordingly issued giving the prices on each size of Saw, as shown in the following revised list of Cross-Cuts issued by

Henry Disston & Sons, Philadelphia. This list is subject to the regular discount of 40 per cent.:

	4ft.	4½ft.	5ft.	5½ft.	6ft.	6½ft.	7ft.	7½ft.	8ft.	
Great American Tooth.....	\$2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	each.
Lumbermen Tooth.....	2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	"
Diamond Tooth.....	2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	"
Fleam Tooth.....	2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	"
Perforated Lance Tooth.....	2.72	3.06	3.40	3.74	4.08	4.42	4.76	5.10	5.44	"
Lancet Tooth.....	2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	"
Electric Tooth.....	2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	"
Champion Tooth.....	2.32	2.61	2.90	3.19	3.48	3.77	4.06	4.35	4.64	"
Champion Tooth No. 2.....	2.16	2.43	2.70	2.97	3.24	3.51	3.78	4.05	4.32	"
Tuttle Tooth No. 1.....	2.56	2.88	3.20	3.52	3.84	4.16	4.48	4.80	5.12	"
Tuttle Tooth No. 2.....	2.40	2.70	3.00	3.30	3.60	3.90	4.20	4.50	4.80	"
Plain Tooth No. 1.....	2.32	2.61	2.90	3.19	3.48	3.77	4.06	4.35	4.64	"
Plain Tooth No. 2.....	2.16	2.43	2.70	2.97	3.24	3.51	3.78	4.05	4.32	"
Tenon Tooth No. 1.....	2.32	2.61	2.90	3.19	3.48	3.77	4.06	4.35	4.64	"
Tenon Tooth No. 2.....	2.16	2.43	2.70	2.97	3.24	3.51	3.78	4.05	4.32	"
Hook Tooth No. 2.....	2.16	2.43	2.70	2.97	3.24	3.51	3.78	4.05	4.32	"
Triumph Narrow without handles:										
Champion Tooth.....	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70	2.88	"
Diamond or Great American Tooth.....	1.52	1.71	1.90	2.09	2.28	2.47	2.66	2.85	3.04	"
Humboldt, California, Toledo Blade and Sabine.....	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	"

**Whips.**—As relating to a line of goods handled by many in the trade, the quotations given below will be of interest. They represent some of the leading goods of the American Whip Company, Westfield, Mass., and 54 Warren street, New York:

IXL Whalebone Driving Whips:									
4½	5	6	6½	7	7½	8 feet.			
\$18	\$20	\$22	\$24	\$27	\$30	\$33	\$36	per doz.	
Eureka, Two-third Whalebone Whips:									
5½	6	6½	7 feet.						
\$15	\$16.50	\$18	\$20	per dozen.					
Bull Bone, Half-length Whalebone Whips:									
5½	6	6½	7 feet.						
\$11	\$12	\$13	\$15	per dozen.					
American Standard, Half-length Whalebone Whips:									
4½	5	5½	6	6½	7	7½	8 feet.		
\$8	\$8.50	\$9.50	\$10	\$12	\$13.50	\$15	\$16.50	per doz	
True Grip, Raw Hide Center Whips:									
4½	5	5½	6	6½	7 feet.				
\$6	\$6	\$6.50	\$7	\$7.50	\$9	per dozen.			
New Name, Stocked Java Whips:									
Black and wine colors, 6 feet, \$6 per dozen.									
Americans, '93 Pen Whip. A unique penholder with each Whip:									
6 feet..... \$6 per dozen.									
Gents' Light Driving:									
No. 111—6 feet..... \$6 per dozen.									
No. 106—6 feet..... \$5 per dozen.									
No. 103. Hand-made Stocked Java, black and wine colors:									
5½	6	feet							
\$3.75	\$4	per dozen.							

The company also make a large variety of cheaper grades which sell from 50 cents to \$3 per dozen; Team Whips, ranging from \$2 to \$7.50 per dozen, and Toy Whips, from \$2.50 to \$12 per gross. Their assortment also includes Whips, gold mounted, with ivory handles; Coach, Tandem and Tally-ho Whips, and Ladies' and Gentlemen's Riding Whips. The company are making a specialty of their new Hardware assortment, 10/American, which is composed of 75 Whips carefully selected, intended to retail at \$75. It includes one Sign Whip, worth \$5; 100 Rules with dealer's name on, and 100 Folders for distribution to customers, for which no charge is made. The price of this assortment to the trade is \$50.

**Guns and Rifles.**—The Remington Arms Company, Ilion, N. Y., Hartley & Graham, selling agents, 313 Broadway, New York, announce reductions of from 10 to 20 per cent. on Breech Loading Shot Guns and Rifles. The significance

of this departure is an intention on their part of marketing a much greater production and also bringing these fire-

arms more within the range of a popular demand for a good article, as against similar goods of foreign manufacture. It is emphatically stated that there will be no lowering of the quality, but that it will remain the same as heretofore.

**Enterprise Mfg. Company.**—The following changes in list prices are announced, under date January 17, by Enterprise Mfg. Company, Philadelphia:

No.	Per dozen.
75, Sad Irons, either Nos. 1, 2 or 3.....	\$4.75
76, ".....	5.00
87, Polishing Irons.....	6.25
77, ".....	5.00
105, Toy Irons.....	4.25
Each.	
55, Family Outfit of Sad Irons.....	\$3.50
1, Sad-Iron Heater.....	1.35
2, ".....	1.85
650, Bone, Shell and Corn Mill.....	7.50
1, Coffee Mill.....	2.25
2, ".....	3.50
2½, ".....	4.50
209, ".....	25.00
21, ".....	30.00
212, ".....	35.00
214, ".....	40.00
16, ".....	40.00
218, ".....	50.00
218, ".....	55.00
62, Power Meat Chopper.....	225.00
35, Sausage Stuffer.....	6.50
Barrel Jack, Truck and Stand.....	6.00

Under date January 18, they announce the following discounts applying to their catalogue of 1892:

	Per cent.
Lawn Mowers.....	40
Lawn Mower Parts.....	
Sad Irons.....	30
Sad Iron Handles.....	
Cherry Stoners.....	
Fruit, Wine and Jelly Presses.....	
Hand Power Meat Choppers.....	
Ice Shredders.....	25
Lawn Sprinklers.....	
Sausage Stuffers.....	
Sausage Stuffing Attachments.....	
Shoe Stands and Lasts.....	
Barrel Jacks.....	
Beef Shavers.....	
Bone, Shell and Corn Mills.....	
Bung-Hole Borers.....	
Cheese Knives.....	
Coffee Mills.....	
Flag Holders.....	20
Fruit Augers.....	
Measuring Faucets.....	
Molasses Gates.....	
Power Meat Choppers.....	
Tincture Presses.....	
Tobacco Cutters.....	
Barn Door Bolts.....	
Bullfrog Door Weights.....	
Cork Pressers.....	
Cork Pullers.....	15
Mole Traps.....	
Sad Iron Heaters.....	
Vegetable Slicers.....	
Parts, excepting Lawn Mower and Sad Iron Handles.....	20

**Perfect Lawn Rake.**—F. E. Kohler & Co., Canton, Ohio, are selling the Perfect Lawn Rake, a description of which appeared in our last issue, at the following prices:

No.	Per dozen.
1, 22-inch wide, 28 teeth and hood.....	\$4.50
2, 22 " " 28 " without hood...	3.75
3, 18 " " 22 " and hood.....	4.00
4, 18 " " 22 " without hood...	3.50

**Indurated Fiber Ware.**—Cordley & Hayes, 173 and 175 Duane street, New York, issue under date January 25 a list of Indurated Fiber Ware which supersedes all previous lists. They also call attention to a reduction in their Star Pails, which are now listed at \$4.20 per dozen, which is subject to the regular discount of 25 per cent., f.o.b. New York, cash 30 days, less 2 per cent. for cash in 10 days. On an order for not less than \$100 list, all to be shipped at one time in one lot, delivery will be made at any railroad station east of the Mississippi River. They also allude to the fact that low prices are named on other articles.

**Planes.**—We are advised by H. Chapin's Son, Pine Meadow, Conn., that he has withdrawn the portion of his discount sheet recently issued relating to Planes, and the following revised quotations are announced, terms 30 days or 2 per cent. discount for cash in ten days:

	Discount, Per cent.
Bench Planes, Common Pearce.....	50
" " Extra and Premium.....	45
" " With English Irons instead of American.....	30
Ship Planes.....	45
Miscellaneous Planes.....	40
Bench Planes, Apple, Box and Rosewood..	20
Carriage-Makers' Tools.....	20
Molding Planes.....	40
Grooving Plows.....	40

**Freezers.**—There is little to report this season in regard to Freezers, the line of goods put on the market by the different manufacturers being substantially the same as last year, with slight modifications and improvements suggested by experience. The competition between the manufacturers continues very active, but prices are not materially lower than they have been, and they are referred to as leaving the manufacturers a narrow margin of profit. There is a general anticipation of an active demand during the season, partly in view of the bountiful supply of ice which is assured throughout the country, and partly in view of the fact that stocks in dealers' hands are probably lighter than for several years, so that both jobbers and retailers will enter the market with practically no old stocks carried over. In addition to this the natural increase owing to the general prosperity of the country and the constant extension in the demand for Freezers will tend to make the business large.

**Glass.**—During the past week there have been no further developments in completion of arrangements by the National Glass Company. Demand for window Glass is still limited and American factories are doubtless accumulating stock. The market as a rule is firm, but there is noticed a disposition on the part of some manufacturers to move stock by making

slight concession in prices for large lots. The outlook for the coming season is considered bright, and it is believed that present prices will be strictly adhered to, if not advanced, when spring trade opens. Business with jobbers is quiet, though prices are fairly well maintained. American Plate Glass is being quoted from Pittsburgh by D. E. Wheeler, agent, at 60 and 2½ per cent. discount to the retail trade. Jobbers are making open prices of 60 and 5 per cent. discount, and close buyers, it is understood, can buy at from 60 and 7½ per cent. discount to 60 and 10 per cent. discount. French Window Glass is not very firm at 75 and 10 and 5 per cent. discount, though there is a disposition on the part of some importers to advance prices slightly in the near future. Future prices of American and Imported Window Glass will depend largely upon the demand. Present quotations on Glass are as follows: American Window Glass, 1000-box lots or more, 80 and 15 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 60 and 2½ per cent. discount to 60 and 5. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

### The Heavy Hardware Jobbers' National Union.

FROM a new letter head of the Heavy Hardware Jobbers' National Union we take the following list of officers:

President: S. D. Kimbark, Chicago.  
Vice-Presidents: Gaius Paddock, St. Louis, Mo.; Francis Boyd, Milwaukee, Wis.; W. B. Dean, St. Paul, Minn.  
Treasurer: Robert E. Brier, St. Louis, Mo.  
Secretary: Chas. T. Brace, St. Louis.  
Executive Committee: J. J. Parkhurst, Chicago, Ill.; C. R. Blake, St. Louis, Mo.; Robert Donahue, Burlington, Iowa; Geo. Deming, Cleveland, Ohio; J. J. Slattery, Louisville, Ky.

The aim and objects of the association are thus stated in a recent communication from J. J. Parkhurst, Gaius Paddock and George Deming, a committee appointed for this purpose.

After four years' experience we are satisfied that the association has done a large amount of good, mainly in making the members better acquainted, and thus removing many of the jealousies and misunderstandings existing between jobbers located in competing territory. We have agreed to continue the association, not for the purpose of controlling either the buying or selling price of goods, but for social and legitimate business purposes, and especially to be in a position to combat any evils that may arise in the management of our business, or what we consider wrong in the method of selling adopted by any manufacturers of goods we handle, and with this end in view, we invite all the jobbers in Iron and Heavy Hardware to join us.

The following houses are members of the association:

S. D. Kimbark, Chicago.  
Kelley, Maus & Co., Chicago.  
Parkhurst & Wilkinson, Chicago.  
Paddock, Hawley Iron Co., St. Louis.

Sligo Iron Store Co., St. Louis.  
Beck & Corbitt Iron Co., St. Louis.  
Dodge, Haley & Co., Boston.  
R. B. Porter & Son, Baltimore.  
George Worthington & Co., Cleveland.  
George Cooper & Co., Cleveland.  
W. Bingham Co., Cleveland.  
McIntosh, Huntington Co., Cleveland.  
Shadbolt & Boyd Iron Co., Milwaukee.  
Suelflohn & Seefeld, Milwaukee.  
Roehm & Davidson, Detroit.  
H. Sherer & Co., Detroit.  
Todd, Donigan Iron Co., Louisville.  
W. B. Belknap & Co., Louisville.  
I. F. Stone & Co., Louisville.  
Fulton & Conway, Louisville.  
Fowler & Son, Buffalo.  
Van Camp Hardware Co., Indianapolis.  
Coombs & Co., Fort Wayne.  
Mossman, Yarnelle & Co., Fort Wayne.  
National Hardware Co., Cincinnati.  
Morley Bros., Saginaw.  
Nicols & Dean, St. Paul.  
Janney, Semple & Co., Minneapolis.  
Robert Donahue, Burlington.  
Sieg Iron Co., Davenport.  
W. S. Bruce & Co., Memphis.  
Buford Bros., Nashville.  
Richards & Conover Hardware Co., Kansas City.  
Gille Hardware & Iron Co., Kansas City.  
W. J. Broatch, Omaha.  
Baum Iron Co., Omaha.  
Foster, Stephens & Co., Grand Rapids.  
Brown, Hall & Co., Grand Rapids.

### Nitro Powders.

UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn., are about issuing suggestions for loading their U. M. C. Co.'s Smokeless and Trap Shells with Nitro Powders, such as Schultze, Am. Wood, S. S. and E. C. After referring to the fact that their Trap and Smokeless and other brands of high-grade Shells have their well-known No. 3 Primers, which are referred to as of extra strength, giving quick ignition and complete combustion to the powder charge, being perfectly adapted to the various Nitro Powders as well as Black Powder, they give the following suggestions, which are of special interest and deserving the careful attention of those using the powders.

To obtain the best results with these Shell and the various Nitro Powders, the following suggestions should be observed:

Charge of Nitro Powder should not exceed

3¾	drams. (by measure) for 10 gauge.
3¼	" " " " 12 "
2½	" " " " 16 "

Do not prime with Black Powder, as No. 3 Primers render such trouble unnecessary.

Use wadding of liberal thickness, but not too hard nor too large in gauge. Leave ¼ inch of paper for crimping.

Ramming or hard pressure of wads on Nitro Powders should be avoided. Press the wads firmly home, and crimp tightly on the shot wad.

Do not expose Nitro Powders to artificial heat, which will dry out their moisture. The strength of these powders is regulated to give best results when in their normal condition, which is not affected by exposure to cold or to any natural temperature or atmosphere.

## Bicycles.

SIXTH ARTICLE.

**UNION CYCLE MFG. COMPANY,** 166-170 Columbus avenue, Boston, include in their line of Union Bicycles for 1893 Union P. D. Q., Union No. 3, Union 2.10 and Union No. 2. The Union P. D. Q. is a '93 wheel in which a large size of tubing is used, thus adding to the stiffness of the machine under strain. The steering head is long, the advantage of this, it is remarked, being that the frame increases in strength in proportion to the distance which separates the two forward frame tubes at their connection with the steering head tube. The machine is fitted with dust proof bearings, corrugated rim, air-tight tire, and is geared to 53, 56, 60 and 63 inches. It weighs 32 pounds and has a wheel base of 43 inches. Union No. 3 is the new ladies' machine, having a finely curved backbone of  $1\frac{1}{4}$  inch steel tubing, which gives a rigid frame. The lines and riding position of the No. 3 are especially referred to as correct, and the light cranks of shorter throw than those on the gentlemen's machine with smaller pedals as adding greatly to the graceful movement of the rider, and as making the foothold more certain. The Union 2.10 for gentlemen and Union No. 2 for ladies were both on the market during '92 and need no special description. The company guarantee all their bicycles with fair and reasonable using for ordinary riding purposes only for one year from date of purchase.

**THE CHAUTAUQUA CYCLE COMPANY,** Jamestown, N. Y., whose wheels were first put upon the market last year, have endeavored to embody in the 1893 Chautauqua all the features desired by wheelmen, and to overcome the weak points. The Chautauqua Light Roadster is made with a Humber pattern frame; weldless cold drawn steel tubing, with connections worked from drop forgings. It is provided with Thomas pneumatic tire or any other tire ordered; Crescent steel rims; dust-proof ball bearings throughout; Sager pattern saddle, or others if desired; Curtiss or Brown pedals, and direct plunger pattern brake. The wheel base is  $43\frac{1}{2}$  inches, weight including tools 36 pounds, and geared to 56 inches, or any other desired. Their other machine, the Road Racer, is the same as the Light Roadster, except that there is no brake; that the wheel base is 44 inches and the weight 30 pounds. The company also manufacture Bicycle Sulky attachments. It is their intention to make between 300 and 400 wheels this year, and to dispose of their product through agents and to consumers.

**KENWOOD MFG. COMPANY,** 253-255 South Canal street, Chicago, make very few changes in their wheels for the coming season, with the exception of some slight improvements in the tire, valve, chain, handle bars, height of steering head, wheel base and rims, also lessening the number of spokes in the wheels. Their line consists of the Kenwood Road Racer, Ken-

wood Roadster, Kenwood Tricycle, Kenwood Ladies' Special, and Kenwood Ladies' Special with spring fork. The Road Racer has an additional rake to the seat post tube to place the saddle in the proper position for scorching, and a wheel base of 45 inches. It is furnished with Kenwood pneumatic tires; hubs and crank shaft with dust-proof ball oilers; machine-cut detachable rear sprocket wheel; geared to 60 inch, and weighs ready to ride 33 pounds. The Roadster is furnished with molded cushion or pneumatic tires; Kenwood ball pedals with removable hardened steel ball cups; rear wheel brake, with ball and socket joints; geared to 57 inches, weighing all on 40 pounds. The Tricycle is made with Kenwood drop frame and fork; geared to 53 inches; light adjustable coasters; new Kenwood saddle, with tilting adjustment, and weighs 50 pounds. The ladies' special is made with and without adjustable spring fork; with Kenwood U frame;  $5\frac{1}{4}$ -inch throw detachable cranks; special pedals  $3\frac{1}{4}$  inches wide; rear wheel brake with ball and socket joints; saddle with tilting adjustment; geared to 53 inches, and weighing, all on, 37 pounds.

**THE ROYAL CYCLE WORKS,** Marshall Mich., manufacturers of high-grade wheels, retain somewhat the same lines that were in their 1892 Scorcher, but have completely remodeled the wheel in all points of construction. They state that their workmanship and fittings are far ahead of anything before turned out by them, and refer especially to the mechanical construction, workmanship and finish of their machines. The Royal Limited, referred to as an ideal Scorcher, built for speed, is built with all steel forgings; Royal adjustable ball bearings all around, with special pattern light hubs; rat-trap pedals; geared 60 inches; scale weight with Morgan & Wright racing tires, all on, 27 pounds. Royal Light Roadster has brake to front wheel; geared to 60 inches, and weighs, all on, 40 pounds; stripped for scorching 34 pounds. Ladies' Royal is built for comfort, light in weight, and with ample room between the handle bars and saddle for mounting. The handles come back so as to be easily reached without stooping or leaning forward. It has an adjustable plunger brake; detachable lamp bracket, and porpoise hide lace guards to wheels and chain. The company believe in the agency system for marketing their goods, and remark that they have found some very good agents in the Hardware trade.

**GENDRON IRON WHEEL COMPANY,** Toledo, Ohio, for their 1893 wheels are making the Gendron Nos. 15, 14 and 13. In the No. 15, the head is made from one piece of weldless tubing with the ends cupped for ball races. The top and lower bars are connected by being wrapped entirely around the head and brazed. The crank shaft sleeve is made from a piece of weldless tubing to which is attached the lower bar at its center, by being wrapped entirely around and brazed. To each end of this sleeve are attached the rear fork tubes

in the same manner. The lower end of the seat post column is joined to the lower bar near the crank shaft sleeve by being wrapped entirely around it and brazed. The seat post clamp has the outsides of the clamp lugs cupped to receive a bolt, having the inner side of the head and nut correspondingly convexed to form an adjustable bearing, so that when the lugs are thrown out of line by being tightened the bolt will not be sprung, but kept in a perfect straight line by these adjustable bearings. All of their 1893 wheels have handle bars with a forward and backward telescope adjustment, and the handle bar, post clamp and telescope adjustment clamps are made in the same manner as the seat post clamp already described. This wheel is geared regularly to 56 and 60 inches, or to 64 inches if desired. The weight all on, with various tires, is as follows: Air-tight tire 36 pounds, with Palmer 40 pounds, and with G. & J. 38 pounds. The No. 14 is a ladies' machine, having a double tube drop frame, with a 10-inch head, made from one piece of weldless tubing and ends cupped for ball traces. All the new devices as described in connection with the No. 15 enter into the construction of this wheel. The dust guard covers a full one-half of the wheel, guards consisting of small spiral steel springs with hooks at each end. One end is hooked in the mud guard and the other in a half circle plate attached to the axle. The upper part of the chain guard is made of light sheet steel with wired edges, and a light steel wire is diagonally laced across the space between the upper and lower part. No. 13 is a strictly high-class wheel for boys, and is constructed identically the same as the No. 15, differing only in size. The wheels are both 26 inches, with  $1\frac{1}{4}$  inch Greyhound pneumatic tires. Special attention has been given in this line of machines to correct principles of frame construction; as to the location of the saddle with reference to the crank shaft, the distance of the front wheel from the center of the crank shaft, and to the adjustability of the handles not only up and down, but also backward and forward.

**THE ECLIPSE BICYCLE COMPANY,** Indianapolis, Ind., with factory at Beaver Falls, Pa., include in their line of Bicycles for 1893 The Eclipse road wheel, all on; the Eclipse Scorcher, stripped; the Eclipse Racer and the Ladies' Eclipse. The road wheel has the frame of weldless steel tubing; 11-inch steering head; 28-inch wheels; detachable cranks; Morgan & Wright style pneumatic tires, weighing, all on, 38 pounds. The entire wheel is of the finest quality of steel. The Scorcher has the same specifications as the road wheel, but carries no brake; has Scorcher saddle and rat trap pedals. It is intended for a fast Wheel, combining speed with sufficient strength and durability to stand any kind of road surface on hill or level, and weighs 34 pounds. The Racer will be built to meet the demand as the season develops it, in lines, weight and running qualities. In the Ladies' Eclipse have been combined qualities of strength, easy running and grace. The manufacturers

believe that for 1893 a ladies' wheel must have every point of excellence that is required in a men's wheel, in frame, tires, saddle and weight. This wheel has the Morgan & Wright style of pneumatic tire, silk lace dress guard, and weighs 36 pounds.

### Export Notes.

THE LONDON *Times* says that the Cape Town (South Africa) Government is about to send a commercial agent to New York.

Late advices from Martinique and Guadeloupe, the French West Indies, indicate that the new customs schedules of the islands are having much less effect upon imports from the United States than was expected. The information is that the tariff, effective about January 11, makes no increase worthy of note in the duties levied on American goods as a rule. Two notable exceptions, however, may be mentioned. On Cotton seed Oil used by the residents in large quantities for food purposes, the duty has been reduced from 40 wide; rear wheel brake with ball and francs to 16 francs per 100 kg. (equivalent to 220.46 pounds avoirdupois), while to favor the French fisheries the rate on codfish from this country is made practically prohibitive, 60 centimes per kilogram (approximately 5½ cents per pound).

The requirements of the act of Congress compelling the railroads transporting freight from the United States into Canada and Mexico to furnish the Washington Bureau of Statistics with full information relating to quantities and values of merchandise so shipped, has lately been discussed by the Board of Accounting Officers at the offices of the Trunk Line Association in this city. January 15 was the date first decided on when the required information was to have been sent, but as few of the railroads were able to respond so speedily, a dispatch has been received from Chief Brock of the Bureau of Statistics, saying the time had been extended until April 1. The Board of Accounting officers will decide upon the size, style and color of the special railroad manifest to be used in connection with this character of shipments.

The Mexican Government has commissioned the Mexican Northern Pacific Railway Company to construct a new railroad from Chihuahua 120 miles west to Guerrero, 30 miles of the proposed road having already been graded by the old Mexican Northern Pacific Company. The intention is to operate it in connection with the railroad now being constructed from Deming, New Mexico, on the Southern Pacific Railroad, to Carralitos, Mexico, by the same company. The road will pass through a rich agricultural country. The grade is very favorable.

A circular has been issued by President John Newton of the Panama Railroad Company, announcing that arrangements are complete for putting in operation their

new Colombian line of steamers under American registry between New York and Colon. It will conduct a mail, passenger and freight service, the departure of the first steamer, the "Alamo," being fixed for Wednesday, February 15, from pier 54, North River, to be followed by the "San Marcos" March 1. After that steamers will leave this port on alternate Wednesdays. The return trip from Colon, commencing March 2, will occur on alternate Wednesdays. Further announcement is made that the Panama Railroad Company have established new connections with San Francisco through the medium of the new North American Navigation Company's line of steamers between San Francisco and Panama. The inauguration of these two new lines is independent of all other lines. The traffic department is at 35 Broadway, New York, in charge of Stamford, Parry, Herron & Co.

The Government of Mexico, owing to non-compliance with the terms of the contracts, announce officially the canceling of the following concessions and forfeiture of the deposits: Railroad from Matamoras to Matehuala, deposit \$20,000; railroad from Matamoras to San Luis Potosi, \$10,000; from the Mining Zone to San Felipe, in the State of Chihuahua, \$3000; Mining Zone to Guzman, in the State of Jalisco, \$3000; Mining Zone to San Martin, State of Jalisco, \$4000.

Large quantities of case oil (Kerosene) are going forward to River Plate ports by steamer and otherwise, causing a sharp advance in freight rates.

Hammacher & Delius, export merchants, 123-125 West Broadway, New York, and Hamburg, Germany, report an increasing volume of orders from South American countries, while their European business, in common with that of other houses here, could be better. This firm ship largely of Hardware, Machinery, Tools and the usual line of miscellaneous goods dealt in by exporters. There is now *en route* from the West consigned to them three carloads of manufactured products destined for clients abroad. They are always desirous of placing deserving specialties in foreign markets, among which may be mentioned the Continent of Europe, South America and South African and Australian colonies. Correspondence from American manufacturers in this connection will receive consideration.

Gilbert U. Heinekey, for years a traveling representative in various parts of the world of the Coombs, Crosby & Eddy Company, New York, left here in December last for the purpose of establishing himself in England. He now announces he is permanently located at 6 Jeffrey square, St. Mary Axe, London, E. C., adding: "I beg to inform my friends that the Coombs, Crosby & Eddy Company of New York have appointed me as their representative in this city, and inquiries or communications directed to above address will

have careful attention." Besides attending to their interests, we are advised that he is in a position to entertain propositions from any American manufacturers who have goods for which they desire a market abroad.

As significant of the increasing importance of American export trade and as an indication of the new channels commerce is seeking, may be mentioned the recent location at Bridge street, New York, of a branch house of Theile & Quack, Elberfeld, Germany. The business was established in 1852 and has had mainly to do with the marketing of German and other manufactures, principally Hardware and kindred goods, in the West Indies, Mexico and the Central and South American countries. They now have several branches in these countries in charge of employees who received their business education with the parent house. Perceiving the growth of the American export trade and the exclusive mercantile privileges conferred by some of the reciprocity treaties, mainly those with the Spanish West Indies and Brazil so far, they realized that a house in this country was necessary to retain and enlarge the business already accumulated by them. The concern here will be managed by Conrad Vits, who has spent many years in contact with importers in South American countries. It is a maxim of the house to send out only guaranteed goods. They ask no credit, soliciting from manufacturers and others prices and discounts on a basis of cash payments in ten days. They are general exporters, buying such goods as are needed for the execution of their orders, doing no commission business whatever. They have also a branch house in Montreal, Canada.

An old and well-known export house with European connections, doing a large business in Great Britain and on the Continent, has called our attention to the large falling off in trade between the United States and Spain. About a year ago the Spanish customs authorities issued an order demanding that a certificate of origin should accompany all goods entering that country, which practically has resulted in discriminations against goods from the United States. Heretofore orders taken by European travelers for German or other houses could be executed from here and the fact that they were rebilled by German merchants, for instance, was sufficient to enable them to enter Spanish territory under conditions covered by the favored nation clause. Now that has been changed, to the detriment of American shippers. It is hoped the authorities at Washington may be able to remedy this state of affairs.

THE YOUNGSTOWN STAMPING COMPANY, Youngstown, Ohio, call attention to the Friend Glass Oil Can, by an illustration of the Can on a card, inclosed in a neat case. The Can is referred to as one of the best, and the statement made that they also manufacture several other styles and grades. An accompanying circular illustrates their Blue Band Oil Can, made in 1, 2, 3 and 5 gallon sizes.

## PRIZE COMPETITIONS.

**W**E HEREBY ANNOUNCE a series of six prize competitions relating to trade matters in which our readers are interested. Four prizes of \$50, \$25, \$15 and \$10 will be awarded in each competition.

The competitions are open to all and a general participation on the part of the trade is invited.

We shall have the privilege of publishing any or all of the contributions received.

The committee of award in assigning prizes will take into account the merit of the different contributions and their suitability for publication.

### PRIZE COMPETITION No. 6.

#### How Retailers Can Best Advertise and Extend Their Business.

The object of this competition is to obtain practical suggestions as to the methods which the retail dealer in Hardware, Stoves, Tinware, &c., can advantageously adopt in building up his business, and is intended to cover such points as the following:

- Advertising in the local papers, with suggestions as to how such advertising should be done and to what extent;
- The manner in which circulars and other printed matter may be used;
- A description of any special or unusual methods of attracting and holding trade; and
- General suggestions in regard to ways in which the business can be extended.

An account of any methods which have been found useful in building up trade will be suitable under this competition.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 6.

### PRIZE COMPETITION No. 7.

#### Travelers' Yarns.

The traveling salesman is proverbially happy in the stories which he narrates, and this competition is for the purpose of calling out a collection of good yarns for publication. While the attention of travelers is specially invited to this competition, it is open to all. Stories relating more or less closely to trade or business matters will be preferred.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 7.

### PRIZE COMPETITION No. 8.

#### How to Treat Clerks.

Under this competition, beside a general discussion of the subject, such questions as the following may be considered:

- The extent to which clerks should be given an opportunity of obtaining a knowledge of the business, and of price-lists, prices, &c.;
- Whether it is desirable to have formal rules for the regulation of employees and for the management of the store. If so, a set of rules should be submitted;
- To what extent clerks should be held responsible for their mistakes;
- Suggestions as to how clerks should be treated in order to secure their most intelligent and efficient work;
- Mistakes made in the treatment of clerks.

This competition opens an important subject and it is hoped that it will be discussed fully by merchants and by their clerks from their different points of view.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 8.

### PRIZE COMPETITION No. 9.

#### Shop System of Keeping Track of Jobs.

This competition is intended to call out information in regard to methods of keeping account of the cost of labor and material on tin-shop work, repairing and new work, inside and outside. In connection with the general subject such points as the following may be touched upon:

- Whether blanks or forms are used in connection with such work. (If so, samples should be submitted);
- What record is kept of orders, costs of jobs, charges, &c.;
- How time occupied in going to and from the job is covered;
- Suggestions in regard to the profitable conduct of the shop.

To illustrate the system it is desirable that a specific job (as for example, repairing down spouting and eave trough, or other job of repairing in which new material is used) be referred to and the method of keeping track of the costs in such job fully explained.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 9.

### PRIZE COMPETITION No. 10.

#### Business Maxims—At Least 10.

Those entering this competition will send at least ten maxims relating to the conduct of business, presenting in a brief and pithy manner practical suggestions which may advantageously be followed.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business February 18, 1893.

Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 10.

### PRIZE COMPETITION No. 11.

#### How Small Retailers May Keep a Record of Prices.

The object of this competition is to call out information or suggestions in regard to the best methods to be adopted in keeping a record of prices, showing cost or selling prices, or both cost and selling prices, of Hardware, Stoves, Tinware, &c., in a small retail store employing not more than four persons in the selling and bookkeeping departments, including the proprietors. Those entering the competition are expected to give a concise and clear explanation of their system, and if a price book is used, to submit as illustrating the system at least three specimen pages. If a price book is referred to it may be of any design or arrangement best adapted to the purpose, and may be original with the contributor or may be one of the different price books on the market. Fictitious names should be used instead of the real names of jobbers and manufacturers.

The committee in awarding prizes will take into account the merit of the different systems described, the character of the descriptions given, and the general utility and interest of the contribution.

First Prize.....	\$50.00
Second Prize.....	25.00
Third Prize.....	15.00
Fourth Prize.....	10.00

This competition will be open until the close of business, February 18, 1893.

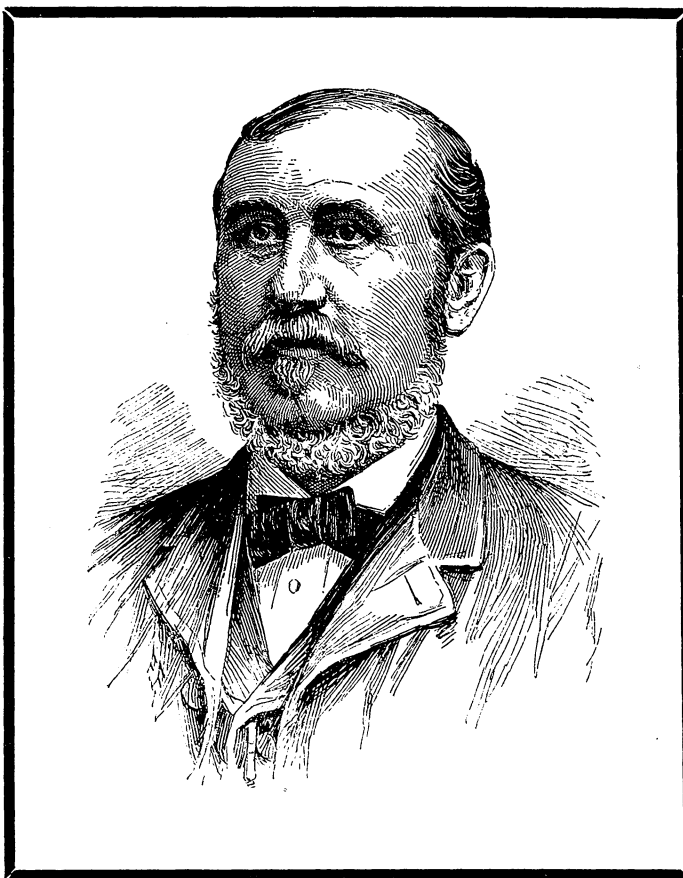
Contributions should be addressed to David Williams, 96-102 Reade street, New York, and marked Prize Competition No. 11.



## Richard T. Buck.

**R**ICHARD T. BUCK, whose death was announced in our last issue, and whose portrait is herewith given, was born in Sheffield, England, October 1, 1831. He came to this country in 1853 and located in Rochester, N. Y., where he worked at his trade as a grinder for the D. R. Barton Edge Tool Company, the business of which is now carried on under the name of Mack & Co. During the latter part of 1853 Mr. Buck, with his brothers, John and Charles Buck, removed to Worcester, where they formed a copartnership under the style of Buck Bros. Here the manufacture of Edge Tools was commenced at the Ethan Allen shops. John Buck retired from the firm in 1863. In March, 1864, the works were removed to Millbury and the business carried on on a more extensive scale. In 1872 Charles Buck retired from the firm and Richard T. Buck became sole proprietor, continuing the business under the old firm name and on a greatly increased scale. The Riverlin works were erected in 1878. Mr. Buck had many years' practical experience in this field of industry, which enabled him to compete with foreign and other American manufacturers, both as to quality and prices. To every detail of his business Mr. Buck gave his personal attention and supervision, and it was due to his energy and tact that the house early gained and has since steadily maintained, its prominence among manufacturers in this line. Mr. Buck held an honorable position in the trade in that it was his constant endeavor to produce goods of high quality and uniform excellence, no attempt being made to compete with goods of lower grade. He always took a special pride in the quality of his goods and the reputation of his house, which holds a high position in the manufacture of Edge Tools, and particularly Chisels and Carving Sets. Mr. Buck was largely interested in temperance work, was a public-spirited man and contributed liberally to church work and charitable purposes. He had traveled extensively, making several European trips, and was well and favorably known to the Hardware trade throughout the country. Those personally acquainted with him recall his practical Christianity, as shown in many deeds of charity. He was ever ready to give kindly advice to young men, in whom he took special interest. His death is a loss to the town of Millbury and to the trade of which he was an honored member.

The business in which Mr. Buck took so much pride will be continued, as mentioned in our last issue, by Edward M. Wood and William L. Proctor, sons-in-law of Mr. Buck, by whom it has been managed for a number of years past. Mr. Wood was brought up in the Hardware trade, but left it in 1884, since which time he has been identified with the Edge Tool business. Mr. Proctor is referred to as familiar with all the details of Steel manufacture. Messrs. Wood and Proctor express their intention to sustain the reputation acquired by the tools of Buck Bros.



*Richard T. Buck*

## Mexican Trade.

**I**N A RECENT REPORT by U. S. Consul Eugene O. Fechet at Piedras Negras on "Mexican Trade and How to Secure It," he says he is satisfied Mexican merchants are ready to buy in the cheapest and best markets for themselves, having no predilection in favor of European marts, simply seeking to place their orders to the best advantage, adding, "and yet there is not a single American commercial house in that consular district." He says the demand is daily increasing for lines of Hardware and manufactures of Iron and Steel from the United States. English and French Cutlery of fine grades and German cheap grades are well introduced throughout Mexico, and it will be very hard for our Cutlery makers to com-

pete in price with the European article, especially the cheaper German grades. There is a growing demand for building and furniture Hardware of American make and he instances the building up of a profitable trade already by enterprising houses in St. Louis, New Orleans and elsewhere. Liberal credits to reliable houses will be needed, as the Hardware trade is largely in the hands of Germans who are shrewd traders, and in the struggle to retain control of a valuable commerce will be backed in Germany by long credits extended by the parent houses to their Mexican branches or correspondents. Barbed Fence Wire is much used in

Northern Mexico and comes exclusively from the United States. He asserts that an American Hardware store in combination with all lines of agricultural tools and machines would do well in any of the larger Mexican towns. All agricultural implements, such as Plows, Harrows, Rollers, Mowers, Threshers, &c., are free of duty, and are all imported from this country. Apparatus and labor-saving machinery for industrial, agricultural, mining and art purposes, moved by hand or foot power, by means of cranks, levers, hand wheels, &c., are subject to a duty of 2½ cents per pound gross weight, being classed as workmen's tools. Sewing Machines are in general use, more commonly found in the poor man's house than the rich man's mansion, almost every town of importance having agencies for American Sewing Machines, the bulk of the business being done on the installment plan. The German imitations of American Sewing Machines, although sold very cheap, have not found favor. Iron and Brass Bedsteads are in great demand in Mexico, there being

an objection to wooden ones on account of the facilities they have for harboring insects. These goods are now almost wholly imported from England on account of the low prices made by our English cousins, and until these wares can be sold to meet English prices nothing can be done. Bedsteads prepared for sale in Mexico should always have mosquito-bar attachments. In conclusion he says:

"In agricultural implements the people need education. Many a poor Mexican wearily and ineffectually turns over his rich soil with a crooked stick pointed with a bit of iron because he knows nothing of the American plow; this is also true of all agricultural implements, from the simplest tools to the power machines. The field is large and practically virgin and will be free from foreign competition. The advantages of using our many agricultural devices for improved cultivation

and labor saving must be demonstrated to these patient, conservative people. In towns that are centers of large agricultural areas our American firms should establish depots of agricultural implements and practically demonstrate all the manifold advantages from their use. The more expensive implements may be sold upon installments, as are sewing machines the first payment to cover freights, duty (if any), &c. In no other branch of trade with Mexico are larger inducements offered to American enterprise than in the introduction of farm implements and machinery, and no field has been more neglected."

### Janney, Semple & Co.'s Catalogue.

JANNEY, SEMPLE & CO., Minneapolis, Minn., have just issued a handsome catalogue of 1105 pages, substantially bound in leather and cloth, with beveled edges and of a fine quality of paper. The desirable arrangement of the cuts and list prices is particularly noticeable, while the whole book gives evidence that neither time nor expense has been spared in compiling it. On the first page is given a view of their stores, 30-36 South Second street, corner First avenue. Goods are classified in departments, which are enumerated on the page opposite the index, as follows:

Mechanics' and Edge Tools..	Pages	1 to 200
Farming Implements and Miscellaneous Hardware..	"	201 to 516
Builders Hardware.....	"	517 to 804
Pocket and Table Cutlery, Razors, Scissors, Shears, &c.....	"	805 to 888
Fishing Tackle, Revolvers, Ammunition, Skates, &c..	"	889 to 968
Granite Iron Ware, Pieced and Stamped Tinware, Tin- ners' Trimmings and Stock.	"	969 to 1,044
Tinners' Tools and Machines.	"	1,045 to 1,064
Blacksmiths' Hardware, Iron, Steel, &c.....	"	1,065 to 1,105

The catalogue embraces a large variety of goods and is especially adapted to the wants of the Northwest trade.

The index is well arranged for ready reference, with the headings in full face type and sub-headings indented in smaller type. The cuts are clear, with sufficient room given them and the prices to avoid a crowded appearance; and under the list prices of each article the number of articles contained in each package is given. Among the illustrations are many of the goods more recently put on the market, as well as those representing standard goods, the class of articles shown indicating a selection of the higher grades and of the most favorably known manufacturers. The catalogue is one of if not the largest and most complete yet published in the Northwest, and reflects great credit upon the enterprise and excellent taste of the firm issuing it. It is their desire to furnish each of their customers one copy free of cost. The compiling of the book was done by W. H. Lowry, a young man regularly in the employ of the house, and the printing by J. H. Yewdale & Sons Company, Milwaukee, Wis., who are making a specialty of catalogue printing. It is certainly a very creditable volume to all concerned.

### New York Hardware Dinner.

WE GIVE BELOW an important official announcement of the Dinner Committee of the Hardware Club, who are making arrangements for the trade dinner, February 21. It is especially desired that at this gathering there be a general representation of the trade at large, manufacturers and merchants, whether residing in New York, its vicinity or other parts of the country. As it would be a matter of very considerable difficulty to send special invitations to all the members of the trade who would be welcomed at the dinner, the committee by the publication of the announcement given below extend an invitation to manufacturers and merchants in Hardware and related lines, in view of which all who desire to attend will feel free to do so. It is hoped that there will be a large attendance of the manufacturing interests in this line, and it would be an especial pleasure if at the dinner there might be a goodly number of prominent Hardwaremen from other cities. The following is the official announcement of the committee:

#### FIFTH DINNER

OF THE

HARDWARE AND METAL TRADES.

RECEPTION, 6 TO 7 O'CLOCK; DINNER 7 O'CLOCK.

The fifth dinner of the Hardware and Metal Trades will be held under the auspices of the Hardware Club of New York, in the Banquet Hall of the Manhattan Athletic Club, Madison avenue and Forty-fifth street, on Tuesday evening, February 21.

We are under obligations to the officers of the Manhattan Club for the courtesy of extending to our guests the privilege of inspecting their magnificent building in all its departments during the evening.

We are not issuing individual invitations, but all merchants and manufacturers in Hardware and related lines are hereby cordially invited to attend the dinner, which it is hoped will be a thoroughly representative gathering of the trade in all parts of the country.

Tickets, \$5 each (wines à la carte), can be had from A. D. Clinch of Underhill, Clinch & Co., 94 Chambers street.

The demand for tickets for the dinner of 1893 exceeded the supply, and it is hoped that applications for tickets this year will be sent in early, as the issue will be limited, so as not to exceed the comfortable seating capacity of the hall.

#### Dinner Committee:

ALFRED D. CLINCH, *Chairman*.  
PETER MCCARTHEE.  
JOHN L. VARICK  
EDWARD C. VAN GLAHN.  
EUGENE BISSELL.

GEO. L. MESKER & Co. of Evansville, Ind., who manufacture and erect Galvanized House Fronts and similar work, have recently occupied their new factory. It is a very handsome building, having a frontage of 310 feet and a width of 150 feet,

and three stories in height. It is said to be one of the largest sheet-metal buildings in the country.

### United States Whip Company.

AS A RESULT of the canvass made the past eight months by C. C. Foster of Boston, representative Whip manufacturers recently met at Portland, Maine, and organized under the laws of Maine the United States Whip Company with these officers: President, L. R. Norton; first vice-president, Ira Miller; second vice-president, E. L. Sanford; treasurer, Lewis Parker; directors, L. R. Norton, Lewis Parker, W. C. Cogswell of Boston, C. C. Foster, James Noble, Jr., E. L. Sanford, Ira Miller. Three more vice-presidents are to be added and 14 more directors, representing the concerns to be taken in. The capital stock will be \$2,200,000, divided in common, and preferred stock as follows: \$1,200,000 in 8 per cent. cumulative dividends, payable quarterly; \$1,000,000 common stock, with \$800,000 of 6 per cent. gold bonds, interest payable semi-annually and principal and interest payable in gold. The plan is to buy up all the Whip firms in the country and bring all under one management, 38 firms having already decided to enter it. The home office will be located in Portland, Maine.

### Combination of Emery Wheel Manufacturers.

THE COLUMBIAN EMERY WHEEL COMPANY, with \$600,000 capital, were organized under the laws of the State of New Jersey, at Trenton, January 12, 1893, and officers were elected as follows:

Frederick S. Dickson, president.  
F. H. Pietsch, vice-president.  
L. Pest, secretary.  
F. R. Preston, treasurer.

The following have been chosen directors of the company:

Frederick S. Dickson, Philadelphia, Pa.  
F. H. Pietsch, Chicago, Ill.  
L. Best, New York, N. Y.  
C. Ross Grubb, Camden, N. J.  
Clarence Tebbets, Waltham, Mass.  
F. R. Preston, Detroit, Mich.  
Harlan Page, Philadelphia, Pa.  
Geo. Maitland, Detroit, Mich.  
Geo. W. Jackman, Bridgeport, Conn.

The company will endeavor to obtain control of the principal Emery mines of this country, and it is expected, as the above list indicates, that all of the most prominent manufacturers of Wheels will enter the combination. We are informed that one of the main points aimed at is to reduce the cost of marketing the product by properly apportioning the territory and by systematizing the selling. No attempt will be made to raise prices, but an effort will be made to have something like a standard price. It is expected that the company will begin business in a few weeks with the following firms as members: Northampton Emery Wheel Company, Leeds, Mass.; Chicago Emery Wheel Company, Chicago; Sterling Emery Wheel Company, New York; Morton Emery

Wheel Company, Worcester, Mass.; Grant Corundum Wheel Company, Chester, Mass.; the Abrasive Wheel Company, Philadelphia; Michigan Emery Wheel Company, Detroit; Vitrified Emery Wheel Company, Westfield, Mass.; Springfield Emery Wheel Company, Bridgeport, Conn.; Celluloid Emery Wheel Company, Newark, N. J.; Waltham Emery Wheel Company, Waltham, Mass.

## SIXTH DINNER

OF THE

### Philadelphia Hardware Merchants' and Manufacturers' Association.

THE sixth annual dinner of the Hardware Merchants' and Manufacturers' Association of Philadelphia was held on Tuesday, January 24, at the Manufacturers' Club in Philadelphia, and was very largely attended. The floral and other decorations were of the most artistic character, reflecting great credit on the gentlemen who had charge of that feature of the dinner. Coffee Mills, Spice Mills, Sausage Stuffers and articles of that kind did duty as bouquet holders, while Files, Saws, Hammers and similar goods were arranged so as to give unique beauty to the table decorations. Fayette R. Plumb presided with his usual grace and dignity, the speakers of the evening being W. W. Supplee, J. H. Ritter, Lewis W. Klahr, T. James Fernly, Gen. Lew Merrill, Chas. F. Warwick, R. O. Moore and others. The Hardware trade was out in full force, the Philadelphia representative of *The Iron Age* being included among the invited guests. The menu was in keeping with the high reputation of the Manufacturers' Club, and was heartily enjoyed by those who were fortunate enough to be present. The speeches were full of life and spirit, and although some of the speakers were most unmercifully gayed, the entire evening was one of the keenest enjoyment and hilarity. If any one labors under the delusion that Philadelphia is a slow place and that its citizens are of the straight-laced order they would soon change their minds if they should happen in on an occasion of this kind. Besides the fun and the really first-class singing facts were presented which modest Philadelphians are apt to overlook—namely, that the largest locomotive works in the world are in Philadelphia, turning out upward of 1000 locomotives per annum; that one fourth of all the Files in the world are made in Philadelphia, the daily output being 3500 dozen per day; that the largest saw works in the world is in the Quaker City, as well as the largest shipyards in America, and one enthusiastic member said that he had always understood that George Washington's little hatchet was made at Fayette R. Plumb's Edge Tool Works, and as Mr. Plumb did not put in a denial the statement may perhaps be in accordance with facts. At any rate, it was agreed that if George Washington was living now he would certainly buy his Hardware in Philadelphia, as the best is always the

cheapest. A Philadelphia manufactured song to Philadelphia music was rendered by T. J. Fernly, the diners joining in the chorus. The music we are not at liberty to give, but the words are about as follows:

#### "Who's That Laughing?"

Music composed by Frank A. Conly, words by T. James Fernly, sung by the latter, with laughing chorus.

Well, now, dear boys, I will sing to you  
Of a man who is full of fun,  
He now is here as our president,  
We call him Fayette R. Plumb.  
He makes fine hammers and hatchets, too—  
Some of which we now do face,  
And it is said that Washington  
Bought his hatchet from Plumb's place.

Well, now, dear boys, if you still will hear,  
And promise not to titter,  
I will sing to you of my young slim friend,  
Whose name is Jas. H. Ritter.  
About a dozen years ago  
To his friends he was a riddle,  
But now his fortune is assured,  
For he is with Charlie Biddle.

And now, dear boys, for fear he will flee  
Before my song is done,  
I'll sing to you of Friend Supplee,  
The wisest of us all.  
And if this year he us outsells,  
And leaves us in the distance,  
Be sure an extra five he gets  
From genial Sammie Disston.

#### CHORUS.

And now, good friends, good advice to you,  
Is ever happy be;  
And when with friends you try to laugh  
Right merrily.  
Whatever journey you may take,  
Wherever it may be,  
I've only one request to make,  
That is, remember me.

#### CHORUS.

Who's that laughing? Ha, ha, ha;  
Who's that laughing? Ha, ha, ha, ha.  
Laughing, laughing, in this room,  
Ha, ha, ha!

## Weekly Prize Competitions.

\$25.00.

FOR MORE than six months Weekly Prize Competitions (\$10) have been an interesting and useful feature of the *Pharmaceutical Record*, a journal issued from this office and devoted to the interests of the drug trade. These weekly competitions have related to a variety of technical and business questions of interest to druggists, and have brought out a large amount of information of much service to the readers of that enterprising journal. In view of the success of this feature we have decided to announce a similar series of Weekly Prize Competitions on questions of interest to our readers, and invite a general participation on the part of the trade. As the object of these competitions is to obtain information which will be of practical service to our readers, and to discuss questions in which they are interested, we shall esteem it a special favor if any in the trade will sug-

gest subjects for such competitions, which, if deemed suitable, we shall take pleasure in using.

In each competition there will be three prizes—a first prize of \$12.50, a second prize of \$7.50 and a third prize of \$5. The prizes will be awarded for the answers which in the judgment of the committee of award are most suitable for publication and of the most general interest. These competitions are open to every one, and it is hoped that there will be a general response from business men. Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers to the different questions will be favorably regarded as meeting the purpose for which these competitions are announced. We shall have the privilege of publishing any or all of the contributions received.

### Weekly Prize Competition No. 3.

SUBJECT:

#### Waste in the Store and How to Avoid It.

This subject is given at the suggestion of a practical Hardwareman, who writes as follows:

I have noticed with pleasure the different subjects for competitions as they have been announced, and am satisfied that a good deal of matter interesting to merchants will be brought out. Permit me to suggest as a subject that might with advantage be ventilated, the matter of leakages in business. There are many ways in which profits may be seriously diminished as the result of carelessness, and the proprietor be at a loss to account for their disappearance. Among the ways this may happen are: Over-weight and over-measure; wasteful use of paper and twine; unnecessary burning of lights; giving away small articles or small quantities when customers would willingly pay for them; abuse or damaging of stock, and the cutting of prices of goods by employees to particular friends. The subject seems to me to be an important one, and if you should see fit to lay it before the trade it is probable that some of your enterprising correspondents will be able to suggest other leakages and how this kind of waste is to be avoided.

The above letter describes in general terms the scope of the competition, and we invite a full discussion on the subject.

The following prizes will be awarded:

First prize .....	\$12.50
Second prize .....	7.50
Third prize .....	5.00

Replies are to be received not later than February 18, 1893. They should be addressed as follows:

DAVID WILLIAMS,

96-102 Reade street,

New York.

Weekly Prize Competition No. 2.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 1. Closing February 4.

How to Avoid the Accumulation of Dead Stock.

No. 2. Closing February 11.

How to Keep the Store Neat and Clean.

No. 3. Closing February 18.

Waste in the Store and How to Avoid It.

Another subject will be announced in our next issue.

Our readers are also reminded of the following Prize Competitions, announced on another page, in each of which four prizes, of \$50, \$25, \$15 and \$10, are awarded:

**No. 6. Closing February 18.**

How Retailers Can Best Advertise and Extend Their Business.

**No. 7. Closing February 18.**

Travelers' Yarns.

**No. 8. Closing February 18.**

How to Treat Clerks.

**No. 9. Closing February 18.**

Shop System of Keeping Track of Jobs.

**No. 10. Closing February 18.**

Business Maxims—At Least 10.

**No. 11. Closing February 18.**

How Small Retailers May Keep a Record of Prices.

## Horace Smith.

**H**ORACE SMITH died suddenly at his home in Springfield, Mass., January 15, 1893, of heart failure. Mr. Smith was born in Cheshire, Mass., October 28, 1808. As a boy he went to work in the shops of the United States Armory, where he remained until 1842, when he moved to Norwich, Conn. There he was employed in the making of small arms with Allen Thurber, and later became a member of the firm of Cranston & Smith. In 1852 he worked in the firearm factory of Allen & Luther at Worcester. Smith & Wesson formed their first partnership in 1853, establishing a factory at Norwich for making the Winchester rifle. In 1855 they sold out the business to the present Winchester Repeating Arms Company. In 1857 Smith & Wesson formed their second partnership and commenced the manufacture of revolvers, Mr. Smith retiring from the firm in 1874. In his personal life Mr. Smith was quiet and retiring, a kind husband and father and a good neighbor, and was a member of the Methodist Church. Mr. Smith was both generous and unobtrusive, and many a poor boy, it is stated, has owed his education to his benevolence, and many people have been able to pass their old age in comfort through his gifts.

## Trade Items.

**T**HE LIGHTNING ICE CREAM FREEZERS, manufactured by Shepard Hardware Company, Buffalo, N. Y., will be made this year with inside parts coated with pure Block Tin, and will be supplied with their new Automatic Scraper, which was first brought out in 1892.

AT THE ANNUAL MEETING of the Denver Hardware Mfg. Company, Denver, Col., recently held, the following officers were elected for the ensuing year: E. R. Hicks, president; A. H. Hatch, first vice-president; G. B. Townsend, second vice-president; F. N. Briggs, secretary, and A. H. Gutsch, treasurer.

REFERRING TO THE CIRCULAR issued by Lalance & Grosjean Mfg. Company and St. Louis Stamping Company in regard to Onyx Ware, Hermann Aich, 43 Murray street, New York, has issued a circular under date January 16, in which he states that all Onyx Ware now being handled by him is sold in infringement of the rights of no one either under assignment of these parties or otherwise. Mr. Aich adds that he carries a full line of Onyx and Blue and White Ware, and also the well-known fancy Marble Tea and Coffee Pots, with nickel trimmings. Of all these goods Mr. Aich advises us that he has a large stock.

THE TESTS as to the relative holding powers of Wire and Out Nails are still in progress at the United States Arsenal at Watertown, Mass. They will be concluded this week, but probably not before Friday or Saturday.

THE HARDWARE FIRM of Shafer & Roberts, Lynchburg, Va., has been dissolved by mutual consent. J. M. Shafer has purchased the interest of A. P. Roberts and will continue the business under his own name. T. A. Alexander, late with Bell, Barker & Jennings, is now connected with Mr. Shafer.

## Columbian Association of Travelers.

**T**HOUSANDS of commercial travelers will take possession of Chicago and the World's Fair next summer, from July 22 until August 1. All arrangements for this great gathering were made on the 14th inst. at a meeting of delegates representing all the big traveling men's associations, held at the Tremont House, Chicago. By working hard for six hours they perfected every detail. A. J. Dowd of Chicago was elected permanent chairman and George C. Cooper, also of Chicago, permanent secretary. The organization was named the Columbian Association of Travelers, and it was decided that their week at the fair should be occupied as follows: First day, inspection of the exposition; second day, grand parade; third day, gathering at the fair and address by the orators to be selected later; the other days, excursions and amusements of various kinds. All manufacturers, dealers and jobbers are to be asked to take their men off the road from July 22 to August 1, whether the men wish it or not.

The preliminary work of the association will rest upon the shoulders of an Executive Committee composed of one man from each organization affiliated with the national body in each State and territory. The following were chosen: Michigan, Nelson B. Jones and G. C. Sampson of Lansing; Indiana, F. B. Russell; Massachusetts, Clinton B. Hobb; Nebraska, J. C. Nate, W. A. Johnson and W. W. Lilly; Iowa, F. C. Way and H. B. Hodge; Illinois, H. B. Smith and C. H. Wood; California, H. L. Judell; Ohio, F. I. Demming and D. J. Caine; Louisiana, Augustus Prentice; Pennsylvania, C. H. Kelly; Missouri, George C. McGrew.

Much enthusiasm was shown by the delegates, and they said they would make a showing of 100,000 on July 26, the day selected for the parade. President Dowd has received an offer from the management of the water palace, now in course of construction, giving the use of the building for an open-air concert.

## Exports.

**T**HE EXPORTS from the port of New York to foreign markets for the week ending January 14, 1898, exclusive of specie, amounted to \$7,439,461. The following are the exports of Hardware, Machinery, Metals and related goods. The totals following each port or country indicate the aggregate value of exports to

such port or country exclusive of specie. The items for Canada and Mexico include merchandise by seagoing vessels only:

ANTWERP.—Total, \$422,975.			
Presses.....	\$700	Cartridges.....	\$180
Shells.....	692	Pumps.....	193
Cart.....	125	Machinery.....	70
Electrical Matl.....	611	Manufd Wood.....	60
Firearms.....	174	Tinware.....	18
Copper.....	14,000	Hardware.....	174
Woodware.....	98		

AMSTERDAM.—Total, \$27,981.			
Machinery.....	\$381	Old Zinc.....	205
Typewriters.....	83		

AUGSBURG.			
Machinery.....			\$113

ARGENTINE REPUBLIC.—Total, \$54,261.			
Tacks.....	\$553	Lamp Goods.....	\$420
Scales.....	697	Hardware.....	7,004
Oilstone.....	165	Crucibles.....	507
Manufd Wood.....	127	Slates.....	270
Pumps.....	375	Carts.....	850
Agricult. Impts.....	24,049	Manufd Iron.....	1,544
Woodware.....	367	Firearms.....	845

AZORES.—Total, \$1,059.			
Pumps.....	\$50	Machinery.....	\$210
Twine.....	24	Manufd Wood.....	3

BRITISH EAST INDIES.—Total, \$20,522.			
Windmill Matl.....	\$563	Firearms.....	\$127
Clocks.....	311	Miss. Goods.....	400
Sewing Machines.....	1,235	Plated Ware.....	705
Lamp Goods.....	1,605	Hardware.....	195
Manufd Iron.....	27		

BRISTOL.—Total, \$197,080.			
Zinc.....	\$4,240	Manufd Wood.....	\$97
Ox. Zinc.....	400	Woodware.....	650

BRUSSELS.—Total, \$840.			
Sewing Machines.....			\$690

BELFAST.—Total, \$3,390.			
Sewing Machines.....	\$2,760	Machinery.....	\$210

BRITISH POSSESSIONS IN AFRICA.—Total, \$9,800.			
Machinery.....	\$3,118	Agricult. Impts.....	\$350

BERGEN.—Total, \$712.			
Agricult. Impts.....	\$26	Pumps.....	\$22
Hardware.....	55		

BREMEN.—Total, \$8,429.			
Manufd Wood.....			\$364

BERLIN.—Total, \$941.			
Rubber Goods.....	\$103	Typewriters.....	\$360
Whips.....	25	Magnet Spools.....	350

BRITISH GUIANA.—Total, \$4,114.			
Organs.....	\$100	Machinery.....	\$1,670
Brushes.....	12	Belts.....	15

BRITISH AUSTRALIA.—Total, \$149,075.			
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Hardware.....	\$9,919	Carriage Matl.....	\$581
Manufd Iron.....	1,799	Manufd Wood.....	1,405
Agricult. Impts.....	5,512	Lamp Goods.....	1,597
Eyelets.....	87	Nails.....	310
Gun Primers.....	30	Firearms.....	1,051
Clocks.....	1,845	Cartridges.....	1,213
Axles.....	132	Organs.....	1,335
Brass Goods.....	35	Pumps.....	395
Windmill Matl.....	720	Gun Matl.....	98
Valves.....	824	Baby Carriages.....	540
Cutlery.....	8	Woodware.....	1,844
Springs.....	48	Tinware.....	122
Machinery.....	2,110	Gun Impts.....	19
Sewing Mch. Mtl.....	16	Scales.....	521
Polish. Material.....	740	Saws.....	54
Plated Ware.....	395	Wringers.....	215
Darts and Slugs.....	25	Sandpaper.....	10
Thermometers.....	54	Agate Ware.....	25
Tacks.....	100	Rubber Goods.....	1,801
Nails.....	35	Sewing Machines.....	14,298
Blocks.....	90	Sew. Mach. Goods.....	110
W. Motors.....	112	Manufd Steel.....	13
Pulleys.....	144	Emery Wheels.....	40

BATUM.			
Scales.....			\$190

BRAZIL.—Total, \$105,475.			
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Manufd Wood.....	\$15	Hardware.....	\$2,293
Lamp Goods.....	395	Manufd Iron.....	557
Cartridges.....	1,422	C. Barrows.....	97
Cutlery.....	4,736	Twine.....	3,080
Woodware.....	74	Tin.....	435
Trunk Matl.....	450	Tacks.....	210
Pumps.....	120	Fire Bricks.....	73
Tinware.....	44	Razor Strops.....	16
Store Trucks.....	45	Nails.....	550
Agate Ware.....	322	Wire Goods.....	9
Emery Cloth.....	45	Scales.....	105
Sewing Machine.....		Sewing Machine.....	
Needles.....	21	Material.....	2
Plumbers' Matl.....	181	Rubber Goods.....	650
Watches.....	409	Firearms.....	3,175
Machinery.....	1,123	Percussion Caps.....	93
Lead.....	27	Sewing Machines.....	1,227
Fish Lines.....	65	Saws.....	17
Cotton Gins.....	175	Velocipedes.....	13
Shot.....	29	Brushes.....	74
Refrigerator.....	60	Clocks.....	385
Gun Primers.....	50	Plated Ware.....	150

BRITISH HONDURAS.—Total, \$9,922.			
Hardware.....	\$382	Manufd Iron.....	\$98
Manufd Wood.....	47	Lamp Goods.....	20
Rubber Goods.....	5	Sewing Machines.....	123
Trunks.....	48	Cutlery.....	27
Cotton Lines.....	30	Woodware.....	10
Firearms.....	45	Tinware.....	46
Anvils.....	45	Cartridge Shells.....	22
Agricult. Impts.....	68		

## BRITISH WEST INDIES.—Total, \$149,273.

Manufd Iron.....	\$1,036	Cartridges.....	\$18
Trunks.....	161	Bird Cages.....	40
Sewing Machines.....	402	Car Wheels.....	228
Hose.....	66	Hardware.....	1,087
Musical Insts.....	62	Manufd Wood.....	248
Carriages.....	2,830	Lamp Goods.....	318
Roofing Material.....	35	Woodware.....	219
Nails.....	33	Slates.....	23
Carts.....	158	Agricuit. Impls.....	65
Tinware.....	149	Nails.....	104
Plated Ware.....	15	Carriage Material.....	288
Stencils.....	50	Freezers.....	84
Organs.....	85	Rubber Goods.....	87
Scales.....	162	Electrical Matl.....	124
Asbestos.....	56	Refrigerators.....	25
Watches.....	13	Water Closet.....	24
Fish Lines.....	25	Machinery.....	1,123
Twine.....	11	Tricycles.....	15
Anchor.....	59	Wheels.....	231
Pumps.....	18	Iron Safe.....	197
Typewriter Cab.....	39	Cutlery.....	16
Plumbers' Matl.....	65	Chain.....	18
Steel Rope.....	34	Spikes.....	16
Iron Bolts.....	220	Coal.....	450
Iron Bars.....	43	Cotton Lines.....	19

## CENTRAL AMERICA.—Total, \$59,455.

Manufd Wood.....	\$147	Manufd Wood.....	\$75
Machinery.....	1,872	Valves.....	11
Rubber Goods.....	243	Hardware.....	2,905
Scales.....	102	Manufd Iron.....	1,439
Anvil.....	11	Lamp Goods.....	59
Nails.....	256	Sewing Machines.....	323
Firearms.....	39	Agricuit. Impls.....	574
Grindstones.....	22	Cutlery.....	323
Twine.....	57	Waterwheel Mach.....	563
Fuse.....	345	Brushes.....	284
Grindstones.....	19	Carriage.....	265
Woodware.....	98	Railroad Matl.....	145
Organ.....	185	Belts.....	97
Steel Plates.....	106	Powder.....	100
Saws.....	49	Electric Goods.....	684
Zinc.....	270	Quicksilver.....	45
Crucibles.....	12	Steel.....	41
Spikes.....	74	Showcases.....	35
Slates.....	122	Wheels.....	90
Belting.....	10	Iron Pipe.....	347
Tacks.....	31	Plumbers' Matl.....	225
Musical Insts.....	107	Sheet Iron.....	147
Pumps.....	141	Manufd Copper.....	63
Belting.....	270	Belows.....	76
Locomotives.....	8,500	Blocks.....	29
Nails.....	23		

## CHRISTIANIA.—Total, \$87,295.

Machinery.....	\$8,360
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## CUBA.—Total, \$439,106.

Hardware.....	\$9,850	Nails.....	\$2,600
Manufd Iron.....	17,712	Rubber Goods.....	517
Lamp Goods.....	643	Grindstones.....	212
Cutlery.....	1,508	Washers.....	55
Spikes.....	687	Fuse.....	12
Agricuit. Impls.....	365	Blocks.....	115
Belows.....	18	Firearms.....	45
Brushes.....	133	Carriage Material.....	574
Waterwheel Matl.....	2,300	Copper.....	350
Tinware.....	168	Coftin Material.....	130
Sugar Cars.....	5,411	Cuspidors.....	205
Tacks.....	247	Typewriters.....	60
Sewing Machines.....	651	Fire tiles.....	50
Plumbers' Matl.....	140	Carts.....	381
Steel.....	140	Nails.....	463
Brass Goods.....	677	Belting.....	231
Packing.....	8	Railroad Material.....	6,436
Steel Rails.....	5,350	Locomotive.....	8,520
Car Material.....	1,905	Electric Material.....	3,524
Locomotive Matl.....	2,103	Pins.....	409
Pumps.....	3,762	Valves.....	334
Railroad Cars.....	15,400	Building Material.....	74
Wheelbarrows.....	178	Store Trucks.....	174
Tin Plate.....	183	Clocks.....	340
Sugar Wagons.....	2,000	Coal.....	67
Sugar Cars.....	1,035	Engine Supplies.....	1,200
Hose.....	250	Bells.....	50
Sandpaper.....	25	Sugar Wagons.....	3,600
ar Seals.....	20	Steam Whistle.....	56
Diaphragms.....	40	Gas Meters.....	350
Car Brasses.....	3,045	Headlight.....	25
Manufd Steel.....	100	Zinc.....	220
Cables.....	50	Blower.....	150
Baby Carriages.....	200	Ice Boxes.....	132
Bushings.....	15	Slates.....	43
Plated Ware.....	473	Manufd Copper.....	989
Whips.....	28	Velocipedes.....	20
Trunk Material.....	57	Lubricators.....	52
Air Rifles.....	17	Bird Cages.....	297
Organ.....	190	Grindstones.....	19
Manufd Wood.....	2,345	Wire Goods.....	59
Machinery.....	18,732	Powder.....	18
Scals.....	2,064		
Woodware.....	101		

## COPENHAGEN.—Total, \$220,470.

Sandpaper.....	\$220	Machinery.....	\$725
Manufd Wood.....	8	Manufd Iron.....	947
Agricuit. Impls.....	260	Hardware.....	424
Pumps.....	149	Casters.....	50
Organs.....	120	Valves.....	55
Plated Ware.....	180	Rubber Goods.....	125
Clocks.....	125		

## CHILL.—Total, \$8,450.

Firearms.....	\$171	Scales.....	\$55
Hardware.....	178	Plated Ware.....	411
Manufd Iron.....	148	Cartridges.....	124
Electrical Goods.....	250	Clocks.....	122
Musical Insts.....	43	Watches.....	800
Sewing Machines.....	124	Copyping Machine.....	30
Bullets.....	43	Carriage Matl.....	1,100

## CANADA.—Total, \$14,374.

Metal Goods.....	\$23
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## DARLINGTON.

Manufd Wood.....	\$97
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## DARMSTADT.

Sandpaper.....	\$165
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## DUTCH EAST INDIES.—Total, \$1,016.

Hardware.....	\$527	Lamp Goods.....	\$42
Firearms.....	100	Manufd Wood.....	4
Brit. Ware.....	215		

## DEWSBURY, ENG.

Machinery.....	\$348
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## DUTCH GUIANA.—Total, \$3,103.

Trunks.....	\$90	Cigars.....	\$53
Tinware.....	60	Baby Carriage.....	20
Pumps.....	120	Freezers.....	12
Hardware.....	330	Iron Pipe.....	90

## DUTCH WEST INDIES.—Total, \$23,299.

Manufd Iron.....	\$156	Axles.....	\$11
Lamp Goods.....	30	Hardware.....	150
Woodware.....	76	Manufd Wood.....	17
Shoe Nails.....	22	Sewing Machines.....	70
Watches.....	271	Cutlery.....	18
Cyclostyle.....	21	Plated Ware.....	112
Tinware.....	35	Pumps.....	14
Clocks.....	48	Sporting Goods.....	22
Trunks.....	776	Bicycles.....	68
Carriage.....	380	Plumbing Matl.....	35

## DUBLIN.—Total, \$3,065.

Hardware.....	\$676	Manufd Wood.....	\$563
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## ECUADOR.—Total, \$9,432.

Scales.....	\$13	Hardware.....	\$667
Manufd Iron.....	120	Cartridges.....	7
Machinery.....	1,000	Sewing Machines.....	516
Rubber Goods.....	25	Plated Ware.....	85
Cutlery.....	1,775	Trunks.....	24
Woodenware.....	162		

## FRENCH WEST INDIES.—Total, \$33,467.

Carriages.....	\$615	Agricuit. Impls.....	\$22
Steel.....	14	Carriage Matl.....	288
Plated Ware.....	317	Lamp Goods.....	4

## FRENCH POSSESSIONS IN AFRICA.

Agricultural Implements.....	\$550
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## FRANKFORT.

Pumps.....	\$150
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## GOTTENBURG. Total, \$4,772.

Crucibles.....	\$15
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## GIBRALTAR.—Total, \$11,746.

Firearms.....	\$380	Cartridges.....	\$205
Gun Covers.....	38	Scales.....	71

## GLASGOW.—Total, \$461,706.

Woodware.....	\$684	Clocks.....	\$498
Organ.....	71	Packing.....	40
Pumps.....	64	Machinery.....	1,351
Agricuit. Impls.....	234	Belting.....	90
Handle Stuff.....	300	Lead.....	10,000
Manufd Iron.....	75	Ox. Zinc.....	1,086
Manufd Wood.....	1,576	Lamp Goods.....	175
Hardware.....	923		

## GENOA.—Total, \$7,929.

Agricultural Implements.....	\$45
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## GRANVILLE.—Total, \$209.

Fish Lines.....	\$175
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## HAYTI.—Total, \$137,885.

Manufd Iron.....	\$252	Wheels.....	\$10
Lamp Goods.....	250	Hardware.....	73
Plated Ware.....	65	Manufd Wood.....	53
Carriages.....	393	Pumps.....	105
Sewing Machines.....	236	Carriage Matl.....	20
Carts.....	80	Nails.....	145
Hose.....	32	Scales.....	1,825
Rubber Goods.....	16	Machinery.....	777
Hand Carts.....	20	Iron Safe.....	128
Clocks.....	18	Wheels.....	55
Wheelbarrows.....	26	Electric Material.....	15
Stay Tubes.....	720		

## HAVRE.—Total, \$174,045.

Typewriters.....	\$851	Manufd Iron.....	\$55
Copper Matte.....	15,645	Crucibles.....	180
Bobbins.....	700	Electrical Matl.....	186
Whetstones.....	405	Hardware.....	1,021
Carriage.....	500	Rubber Goods.....	2,740
Ice Box.....	110	Agricuit. Impls.....	1,674
Machinery.....	4,271	Copper.....	28,000
Asbestos.....	2,000	Rubber Goods.....	475

## HAMBURG.—Total, \$546,357.

Wringers.....	\$688	Spelter.....	\$13,944
Firearms.....	691	Hardware.....	6,659
Carpet Sweepers.....	120	Agricuit. Impls.....	1,465
Brit. Ware.....	770	Manufd Wood.....	533
Plated Ware.....	185	Rubber Goods.....	1,308
Manufd Iron.....	53	Clocks.....	82
Machinery.....	1,517	Belting.....	1,163
Railroad Veloci- pedes.....	239	Sewing Machines.....	33,681
Washing Machs.....	330	Woodware.....	46
Metal Goods.....	30	Organs.....	3,042
Shells.....	1,590	Mag. Metal.....	9,921
Wagon Matl.....	150	Nails.....	33
Electrical Matl.....	700	Typewriters.....	742
Old Copper.....	2,148	Freezers.....	45

## HULL.—Total, \$191,731.

Hardware.....	\$1,740	Agricuit. Impls.....	\$1,577
Whetstones.....	5	Manufd Wood.....	1,147
Manufd Iron.....	20	Machinery.....	285
Clocks.....	31		

## LEIPSI.—Total, \$127.

Organ Material.....	\$127
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## LIEGE.—Total, \$371.

Rubber Goods.....	\$180	Firearms.....	\$191
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## LONDON.—Total, \$965,000.

Gas Tubing.....	\$135	Metal Goods.....	\$750
Bicycles.....	130	Machinery.....	8,406
Lead.....	9,880	Manufd Wood.....	5,826
Sewing Machines.....	8,222	Woodware.....	3,448
Emery Wheels.....	207	Packing.....	544
Plated Ware.....	40	Rubber Goods.....	402
Manufd Iron.....	78	Hardware.....	1,971
Copper Wire.....	2-0	Wagon.....	180
Iron Safes.....	100	Agricuit. Impls.....	248
Refrigerators.....	25	Grindstones.....	125
Scales.....	214	Firearms.....	213
Carriage.....	350	Trucks.....	326
Sandpaper.....	159	Musical Insts.....	130
Brass Goods.....	165	Typewriters.....	8,593
Organ Matl.....	175	Water Wheels.....	375
Carb. Ore.....	40	Organs.....	2,600
Shells.....	540	Dry Lead.....	480
Electric Material.....	240	Whetstones.....	160
Clocks.....	675	Bathtubs.....	74
Bird Cages.....	259	Spelter.....	7,168
Saws.....	18		

## LIVERPOOL.—Total, \$1,642,077.

Hardware.....	2,361	Sewing Machines.....	\$3,920
Organs.....	5,583	Emery Wheels.....	240
Typewriters.....	1,280	Electric Material.....	1,985
Machinery.....	15,804	Clocks.....	50
Woodware.....	107	Manufd Wood.....	6,819
Lamp Goods.....	256	Rubber Goods.....	625
Grindstones.....	19	Wringers.....	63
Manufd Iron.....	592	Agricuit. Impls.....	395
Silver Ware.....	9,000	Firearms.....	162
Ore.....	40	Min. Fibre.....	396
Copper.....	200	Scrap Steel.....	175
Money Drawers.....	2,006	Twine.....	19
Babbitt Metal.....	4,032	Scientific Goods.....	50
Wagon Matl.....	1,675	Old Metal.....	548
Pol. Matl.....	275	Watches.....	1,275
Metal Polish.....	805	Shears.....	225
Tubing.....	60	Dies.....	80
Wagons.....	220	Sleigh.....	49
Zinc Skimmers.....	2,900	Musical Insts.....	13
Copper Matte.....	96,500	Spelter.....	1,795

## LISBON.—Total, \$34,845.

Machinery.....	\$1,400
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## LEITH.—Total, \$78,073.

Hardware.....	\$178	Lead.....	\$4,900
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## MOSCOW.—Total, \$535.

Iron Tubes.....	\$218	Machinery.....	\$113
Scales.....	95	Manufd Iron.....	109

## MEXICO.—Total, \$40,325.

Hardware.....	\$1,826	Nails.....	\$2
Typewriters.....	40	Manufd Wood...	150
Manufd Iron.....	1,153	Car Matl.....	250
Lamp Goods.....	190	Railroad Material.....	815
Pumps.....	76	Cutlery.....	244
Manufd Copper.....	922	Tin.....	24
Brass Goods.....	158	Electrical Matl...	642
Percussion Caps..	475	Manufd Steel.....	540
Trunk Matl.....	32	Cartridge Shells..	2,276
Machinery.....	2,962	Agricuilt. Impts..	600
Slates.....	17	Rubber Goods.....	42
Brushes.....	87	Fixtures.....	27
Cartridges.....	294	Spikes.....	20
Sewing Machines..	676	Grindstones.....	13
Bicycle.....	130	Scales.....	126
Nails.....	80	Tacks.....	46
Packing.....	53	Bird Cages.....	10
Firearms.....	235	Tinware.....	2



PIRÆUS.	
Plated Ware.....	\$55
PERU.—Total, \$9,513.	
Hardware..... \$844	Rubber Goods..... \$35
Electrical Matl.... 150	Machinery..... 2,381
Sewing Machines.... 309	Scales..... 56
Oil Well Supplies.... 562	Twine..... 110
Cutlery..... 900	Laundry Supplies.... 48
Beltting..... 15	Brushes..... 178
Bicycles..... 109	Signs..... 4
Cartridges..... 183	Lamp Goods..... 40
ROTTERDAM.—Total, \$290,164.	
Machinery..... \$3,282	Hardware..... 695
Tin Scraps..... 100	Sandpaper..... 15
Manufd Wood..... 30	Oil Well Supplies.... 1,098
Iron Tubes..... \$400	
RUTI.	
Sewing Machines.....	\$648
SOUTHAMPTON.	
Machinery.....	\$2000
ST. GALL.	
Rubber Goods.....	\$585
ST. PETERSBURG.—Total, \$36.	
Hardware.....	\$11
STETTIN.—Total, \$93,989.	
Iron Wire..... \$175	Coal..... \$200
SAN DOMINGO.—Total, \$5,859.	
Machinery..... \$200	Nails..... \$98
Coal..... 1,000	Iron..... 914
UNITED STATES OF COLOMBIA.—Total, \$86,891.	
Manufd Wood..... \$127	Hardware..... \$2,717
Lamp Goods..... 434	Manufd Iron..... 5,610
Iron Safe..... 60	Cartridges..... 288
Firearms..... 1,873	Agricult Impls.... 32
Sandpaper..... 119	Washers..... 43
Scales..... 94	Ox Bows..... 127
Spikes..... 119	Machinery..... 942
Nails..... 24	Plated Ware..... 77
Cutlery..... 1,415	Silver Ware..... 78
Wheels and Axles.... 80	Telegraph Matl.... 130
Powder..... 2,475	Electrical Matl.... 548
Sewing Machines.... 3,085	Brushes..... 58
Fuse..... 236	Whips..... 20
Zinc..... 252	Woodware..... 114
Car Matl..... 2,500	Railroad Matl.... 534
Tinware..... 124	Pumps..... 85
Shot..... 117	India Rubber..... 26
Pumps..... 90	Submar. Comp.... 120
Freezers..... 9	Saws..... 6
Blocks..... 55	Lubricator..... 29
Clocks..... 125	Motor..... 280
Springs..... 15	Beltting..... 21
Cart..... 29	Bicycle..... 17
Rubber Goods..... 162	Cotton Gins..... 400
Boiler Matl..... 940	Railroad Cars.... 2,167
Crucibles..... 20	Water Wheel Matl 619
Solder..... 17	Organs..... 38
Forms..... 52	Iron Tubes..... 285
Valves..... 14	Twine..... 50
Zinc..... 206	Coke..... 8
Brass Goods..... 8	Packing..... 34
Fish Lines..... 19	Trunks..... 50
VENEZUELA.—Total, \$143,573.	
Manufd Iron..... \$2,349	Hardware..... \$2,509
Lamp Goods..... 232	Manufd Wood..... 49
Machinery..... 529	Sewing Machines.... 1,628
Electrical Goods.... 1,142	Agricult Impls.... 14
Rubber Goods..... 289	Cutlery..... 1,172
Tinware..... 3	Scales..... 365
Twine..... 649	Pumps..... 157
Windmill Parts.... 653	Sandpaper..... 75
Tacks..... 49	Woodware..... 200
Clocks..... 12	Water Closet..... 51
Brushes..... 50	Grindstones..... 11
Plated Ware..... 49	Saws..... 188
Beltting..... 298	Iron Safe..... 80
Refrigerators..... 65	Brass Tubes..... 102
Saw Teeth..... 15	Freezers..... 16
Castors..... 30	Showcases..... 42
Baby Carriages.... 14	Musical Insts.... 50
Nails..... 189	Canary Cages.... 15
Barrows..... 104	Trunks..... 90
Iron Pipes..... 30	Typewriter..... 79
Thermometers.... 30	Coal..... 158
Hose..... 6	Wheelbarrows.... 125
Fish Lines..... 60	
VALLADOLID.—Total, \$269.	
Pumps..... \$138	Agricult. Impls.... \$131
VIENNA.—Total, \$190.	
Agricult. Impls....	\$135
WARSAW.	
Agricult. Impls....	\$50
WATERFORD.	
Carriages.....	\$180
ZURICH.—Total, \$462.	
Hardware.....	\$162

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

The situation in the market for Paints and Colors is without decided change. In

the way of contracts for base materials nothing is going on that contrasts with the usual run of operations at this season of the year, nor does there appear to be any deviation from the policy of keeping in the straight and narrow road of conservative action. As for the distributive outlet, all that can be said is that the results have been extremely commonplace thus far, since the "old-fashioned winter" has effectually checked out-door work in nearly every section of the country, and also served to defer the placing of orders for goods for delivery during the early spring months. Naturally, salesmen find that resort to their particular talents is in order, and evidence is not wanting they have given some consideration to the idea that means are justified by ends in view. However, competition does not appear to have led to anything in the nature of unusual concessions on prices, and the general market shows very good tone, all things considered.

**White Lead.**—Neither jobbers, large retailers nor contractors have figured with remarkable prominence as buyers latterly and the indications are that the respective interests incline to the opinion that there is more to gain than to lose by going slow for the time being. Uncertainties regarding prices have been smoothed out to a great extent by denial from headquarters that the National Lead Company are shading their lists, directly or indirectly, and evidence of anything more than former aggressiveness on the part of outside producers is lacking. Still, the signs of the times are that outside supplies will be heavier this year than they ever have been before, and the fact that jobbers are not bridled is, in view of past experience, enough to warrant the statement that popular brands of Lead may be secured from second hands at more or less concession from the official list rates for small quantities. Upon the whole it looks as though discriminating buyers may find it to their advantage to be very careful.

**Red Lead and Litharge.**—Orders are not being placed very freely at the moment by either jobbers or large consumers. Still manufacturers and sales agents state that the volume of business is fully meeting expectations, and the business passing is chiefly at old prices.

**Zincs.**—New orders for American Oxide have been running rather small of late and make a modest showing all told, but it is the general report that present output is largely under the control of orders and that manufacturers are adhering firmly to former prices for the various grades. Foreign product is coming this way in moderate quantities only. The wholesale prices remain as before, but some irregularity is heard of in prices made by jobbers on small lots, chiefly where desirable orders for a variety of goods may be secured by a little concession on the regulation rates.

**Colors.**—There have been no new developments in the market for bulk goods used by grinders. Supplies appear to be ample, yet not burdensome, and prices vary to a slight degree only. The cost of other materials is almost stationary also. Hence Dry and Oil Colors ready for painters' use are held as about the line of prices established early in the week and the market for the same and for Ready-Mixed Paints is steady, although rather dull.

**Miscellaneous.**—Contracts to a fair aggregate amount have been made for Bar-rytes and some other lines of clays, but nothing out of the routine for the season has taken place, and prices show no radical change. Block Chalk is quiet, but importers quote stiff prices for future shipments. Few orders are being placed for Whiting or Paris White and the moderate business effected is at the old line of prices.

## Oils and Turpentine.

Drawing the line at a slight reaction in the price of Cotton Seed products, due to disappointing slowness in the demand here, and a rise in Coconut Oils, brought about by speculative buying, there are no distinctly new features to record. At all events, prices have remained almost stationary in other departments, while business has been chiefly of routine character and merely fair for the season in aggregate amount. Continued high cost of Lard and inferior greases serves to support values of most lines of lubricants and Oils used in soap making, and present indications are that those commodities must necessarily cheapen before Oils will go lower. At present the prospects are for a strong market for Lard and greases during the balance of the month.

**Linseed Oil.**—The consolidation project remains unsettled and seems likely to until after the annual meetings of stockholders of some of the concerns interested. Abiding developments the several interests are observing a temperate policy, however, making no particularly active canvass for business, yet taking all orders that came along at the old line of prices. Some substitutes and adulterants that were practically driven out of the field when prices for Raw Oil were not above 40¢ per gallon are again coming to the front and have met with better sale the past ten days than for some time previous. However, the competition from that quarter causes no great stir, and there is a probability of Linseed prices being raised if a combination is effected.

**Cotton-Seed Oils.**—The speculative interest have ceased buying in this market and seem inclined to part with at least a portion of their holdings on every favorable opportunity. They find that foreign markets are offered more and a better quality of Oil manufactured from Egyptian Seed and their chances in that direction are somewhat lessened. Along with this are reports to the effect that some home manufacturers are securing a better supply of raw material and that the output of Oil is running ahead of calculations. These circumstances, in fact, have served to offset the effect of good purchases in the primary points by manufacturers of Lard compounds, and prices are consequently a shade easier. Prime crude has been sold at 42¢ @ 43¢, Prime Summer Yellow at 44¢ @ 47¢ and other refined at corresponding prices.

**Lard Oil.**—Prices that ruled a week ago are adhered to by city manufacturers, and comparatively little supply has come forward from out of town sources at less money. High cost operates to restrict consumption more or less, but the volume of business is fair and little if any accumulation of supply in first hands takes place. Cheaper Oil depends almost wholly upon lower cost of raw material, which, at the present time, seems to be a good way off.

**Fish Oils.**—Crude Sperm, Whale and Menhaden Oils are held very firmly at full former prices, stocks in first hands being unusually moderate. The manufactured products are correspondingly firm, although not selling a great deal more freely than usual at this season.

**Coconut Oil.**—Quite large sales have been made, partly on speculative account, and the market is strong at a sharp advance on late prices. Ceylon sold at from 5½¢ up to 6¢, and for Cochin 7¢ @ 7½¢ is now quoted.

**Spirits Turpentine.**—Business has been rather slow, but with light receipts here and no material change in prices in the primary markets, values have undergone very little change.

### Columbia and Surprise Spring Hinges.

The two spring hinges illustrated herewith are offered by the Van Wagoner & Williams Company, 14 Warren street, New York. The Columbia, Fig. 1, is a cast hinge 3 x 3½ inches in size, strong, durable and of neat design, finished in Japan

cylinder knives and cutter bar in close contact, thus making the mower while in use self sharpening. The mower is designed to run almost an entire season without any change in the set or adjustment screws; but should it require attention, all that is necessary is to slightly turn two adjustment screws. The mower is adjusted by the cylinder only, by two set screws, the cutting bar being stationary.

makers claim a perfect working device is secured at the start and one which will give long service without requiring repair. The revolving head is made of cast metal filled with pure babbitt, and each sprinkler is fitted to the stem on which it revolves. By an ingenious device the parts are assembled and held in exact position when the melted babbitt metal is run into the bearings, which, it is stated, makes a

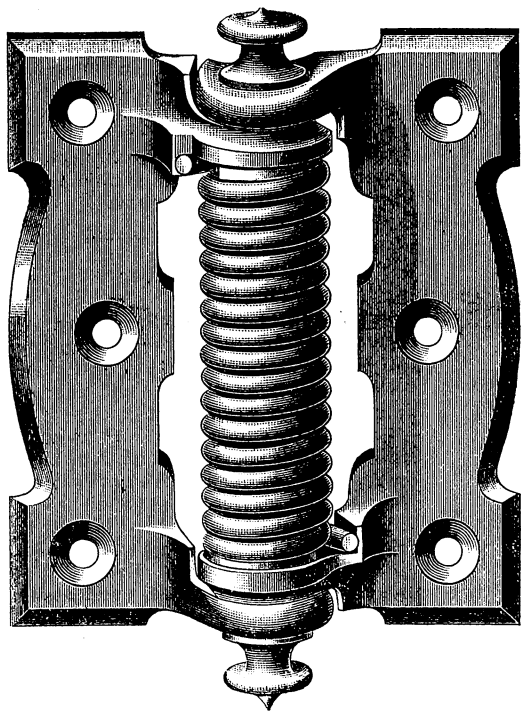


Fig. 1.—Columbia Spring Hinge.

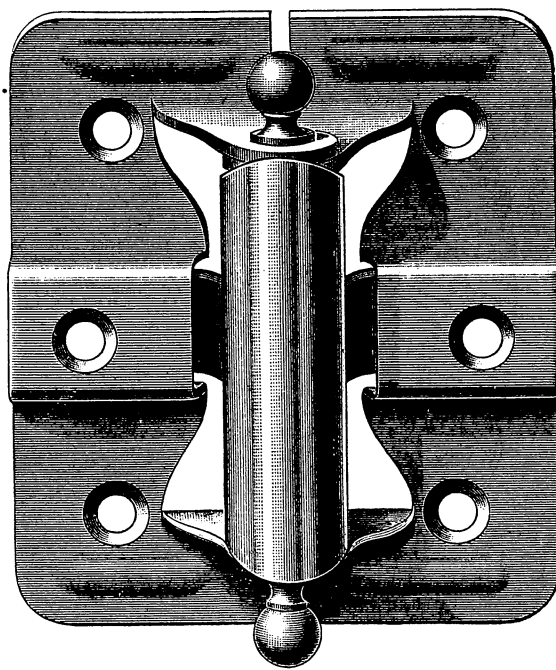


Fig. 2.—Surprise Holdback Spring Hinge.

only. The Surprise Holdback, Fig. 2, is a sheet steel hinge 3 x 3½ inches in size, and so constructed that the door is held either open or shut. The feature of this hinge is the absence of a coil or wire spring as the actuating power. The covering of the pin is of spring steel with extensions on each side working in under the raised parts of the side leaves. As the spring is opened the tendency of the spring is to close it until opened half way, when the tendency is equally strong in the opposite direction, and the spring is held open. The hinge is handsome in appearance, durable and strong, and is attracting the attention of the trade.

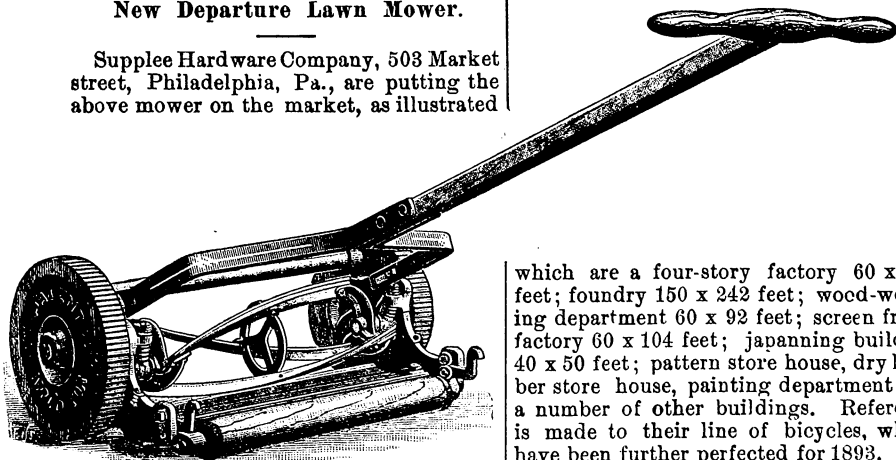
Any slight wear is taken up by the heavy spring. The cylinder can be removed without taking the frame apart. The machine is referred to as being simple in construction, easy to work, not likely to get out of order, made of material of the highest grade, with ratchet of cast steel, simple and positive in action, with all the bearings long and a guard on each plate to prevent grass being entangled with the cylinder.

In an illustrated work devoted to the business and manufacturing interests of Syracuse, N. Y., is given a view of the works of E. C. Stearns & Co. The plant covers an area of about 3½ acres, upon

perfect running fit and one that will not leak. The special feature of the sprinkler is thus the making of the fits by running the metals together in a molten state, avoiding all inequalities of tapers or joints and securing an air and water tight fit. Another important feature of the device is

### New Departure Lawn Mower.

Supplee Hardware Company, 503 Market street, Philadelphia, Pa., are putting the above mower on the market, as illustrated



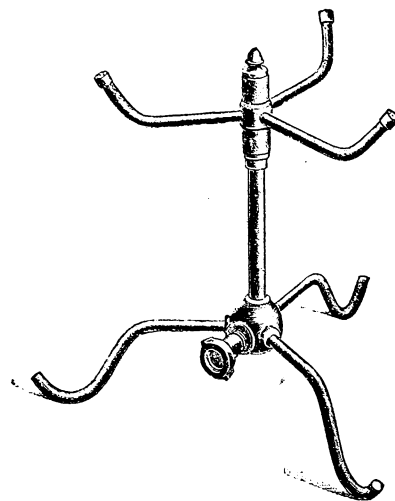
New Departure Lawn Mower.

herewith. The machine is referred to as an entirely new departure in many important and essential points. Two heavy spiral springs are applied to the cylinder bearings, keeping the cutting edges of the

which are a four-story factory 60 x 253 feet; foundry 150 x 242 feet; wood-working department 60 x 92 feet; screen frame factory 60 x 104 feet; japanning building 40 x 50 feet; pattern store house, dry lumber store house, painting department and a number of other buildings. Reference is made to their line of bicycles, which have been further perfected for 1893.

### The Atomizer Lawn Sprinkler.

Blair Mfg. Company, Springfield, Mass., are putting this article on the market. An illustration of it is presented herewith. The novelty in this sprinkler is in the method of manufacture, by which the

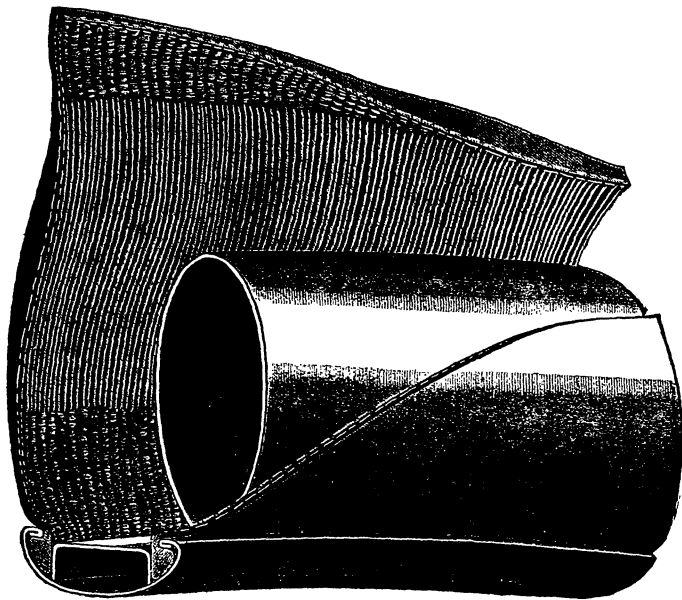


The Atomizer Lawn Sprinkler.

the manner of drilling the spray holes in the revolving tips. They are so located and drilled that the water is vaporized or atomized to its fullest extent, according to the pressure, and the air is filled with a mist which settles on the lawn like a heavy dew. The legs are provided with turned-up ends which permit the sprinkler to be drawn from one part of the lawn to another by means of the connecting hose. Where the hose couples to the sprinkler a brass strainer is provided, which engages and holds all solid matter which may be in the water and so prevents the clogging of the sprinkler. The sprinkler is handsomely painted and nicked.

### The Cleveland Thread Pneumatic Tire and Rim.

H. A. Lozier & Co., Cleveland, Ohio, are using the tire and rim illustrated herewith on their '93 wheels. The tire and rim are referred to as something different from that used by other manufacturers.



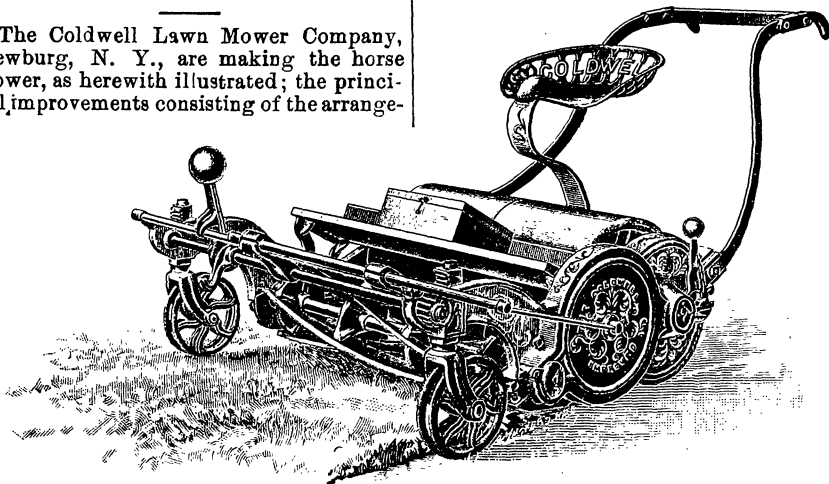
*The Cleveland Thread Pneumatic Tire and Rim.*

The tire consists of an inner tube and an outer covering or shoe. The inner tube is of the best Para gum, while the outer covering or shoe is of equally as good quality of rubber and has for its foundation threads in place of solid canvas or ducking. The threads run transversely, thus supporting the tire and preventing it from flattening. The longitudinal threads are removed from the tread portion of the tire. Thus the rider gets the benefit of the full elasticity and resiliency of the rubber and of the confined air.

The inflating of the inner tube locks the outer covering or shoe securely in the rim. By deflating the tire the outer covering can easily be removed to make any necessary repairs. It is stated that in case of puncture the rider may make permanent repairs in from two to three minutes' time.

### Coldwell Improved Horse Lawn Mower.

The Coldwell Lawn Mower Company, Newburg, N. Y., are making the horse mower, as herewith illustrated; the principal improvements consisting of the arrange-



*Coldwell Improved Horse Lawn Mower.*

ment for adjusting the mower for height of cut, and the arrangement for throwing it in and out of gear. The casters do not pass directly through the side frames, but pass through a square bushing which

passes through the frames, and thus prevents moving the frames. On one side of this bushing is a rack in which a pinion works, the two being connected by a shaft. The shaft is worked by a lever which raises and lowers each side of the machine simultaneously, thus adjusting each side of the machine exactly alike and prevent-

ing unevenness of cut. By pushing this lever downward to its extreme limit the knives can be raised several inches from the ground, and thus avoid coming in contact with stones or other obstructions



*Fig. 1.—B. B. Wire Fence.*

when the machine is being taken to or from the lawn or over carriage drives. Another feature is a side draft attachment which prevents the horse from walking on the standing grass. The mower

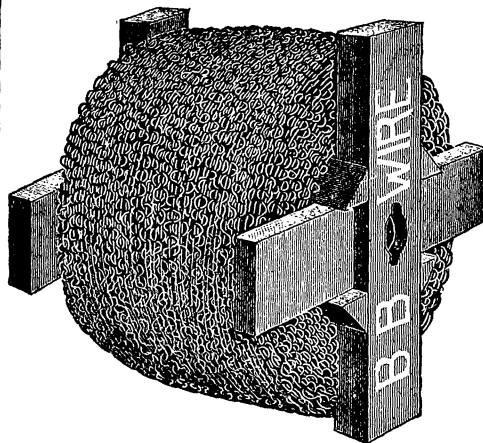
has been adopted by the Government after a thorough competition and critical examination.

P. P. Cuplin, West Bend, Iowa, announces a revolving grand stand. The grand stand is circular in form with a water-tight bottom. This is placed in a basin  $2\frac{1}{4}$  feet deep made in the ground, the stand being held in position by a post through the center. It is stated that the friction is almost entirely overcome, although the weight sustained may be several thousand tons. A stand may be constructed to seat from 5000 to 50,000 persons. The power necessary to revolve the stand in the required time for mile tracks is stated to be 1 horse-power for every 250 people, and the cost of constructing a revolving stand is about 50 per cent. more than the ordinary stand.

### B. B. Wire Fence.

The accompanying illustrations represent the B. B. wire fence, being offered by B. B. Wire Fence Company, Indianapolis, Ind. B. B. wire is one continuous piece, nicely wound on wooden spools of from 80 to 110 pounds each. It is made of spring steel, heavily galvanized, and, the manufacturers claim, will not rust on account of age, season or climate. They also state that the wire will not twist, pull or sag; that the fence will retain its shape substantially as when first constructed; that it is quickly and easily applied to iron or wood posts, and that its application and tension can be readily adjusted and controlled by any kind of wire stretchers or wire lock now in use. The fence is referred to as possessing superior qualities of beauty and strength; of not

destroying stock or even marking them for life by cutting or lacerating their



*Fig. 2.—B. B. Wire on Spool.*

flesh, and having the advantage of being low in price.

Chas. A. Moore of Manning, Maxwell & Moore, New York, has just returned from a trip to the West, and reports the outlook for trade encouraging. They are very busy, and say there is a good inquiry for tools.

**Eagle Padlocks.**

The Eagle Lock Company, Terryville, Conn., and 98 Chambers street, New York, are bringing out a series of new padlocks,



Fig. 1.—Eureka Padlock for Bicycles.—One Key.

as shown in Figs. 1, 2 and 3, all of which are full size cuts. Fig. 1 represents the Eureka padlock and is intended for locking bicycles, although it may be put to various other uses. It is 1 inch in size

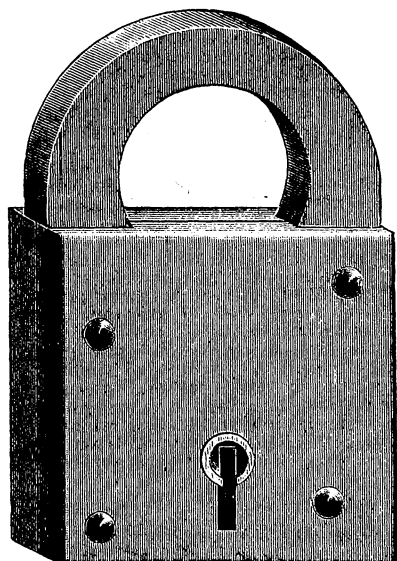


Fig. 2.—Brass and Steel Padlock.

and made in three finishes—iron, red japanned, brass and brass nickelled. It is self-locking, with spring shackle. One flat steel key is furnished with each lock

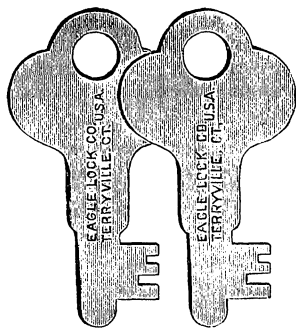


Fig. 3.—Two Keys for Brass and Steel Padlock.

and the locks packed four changes in every dozen. Each lock has 12 inches of safety chain attached. Fig. 2 illustrates a lock made in both brass and steel, size 1 1/4 inches. The brass lock is of plain finish,

self-locking, with spring shackle having three secure levers and two flat steel keys, each set different in a dozen. A similar lock is made of steel, bright finish, with brass center, having two secure levers, in other respects a counterpart of the brass lock previously described. Fig. 4 shows another style of lock, made of iron, 2



Fig. 4.—Keystone Padlock.

inches in size, black japanned, with brass key post and rivets, self-locking and spring shackle. It has four secure levers and two barrel keys are supplied with each lock, there being 12 changes in a dozen.

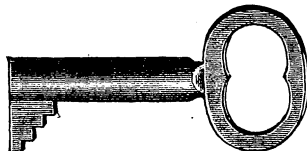


Fig. 5.—Key for Keystone Padlock.

The same pattern is also made in 2 1/4 inch for heavy work, in brass, plain finish, and iron, black japanned; otherwise they are similar locks to the preceding one.

**Golden Crown Ware.**

The Stuart & Peterson Company, Philadelphia, Pa., are introducing a line of this

a flat-bottom oval boiler not in use, while Fig. 2 shows it with the device for regulating the heat under the vessel. This device consists of a V-shaped iron, hinged to a projection cast on the vessel, and when turned down raises one side of the boiler 1/4 inch. The line of vessels include

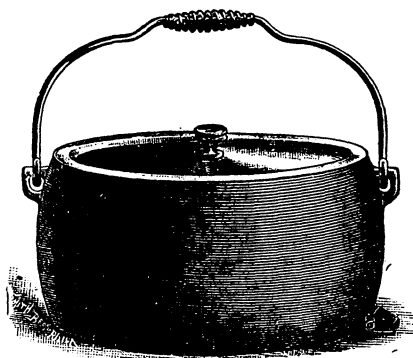


Fig. 1.—Golden Crown Ware.

flat-bottom round boilers, flat-bottom bellied saucepans, deep French stew kettles, deep French stewpans, fish kettles and oyster cookers. The manufacturers claim that the tinning on this ware is of

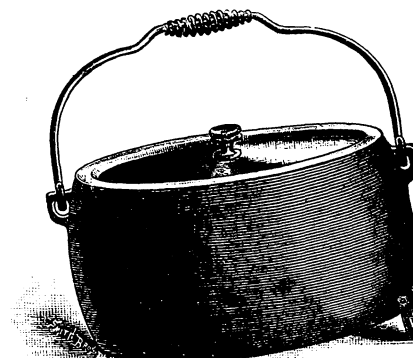
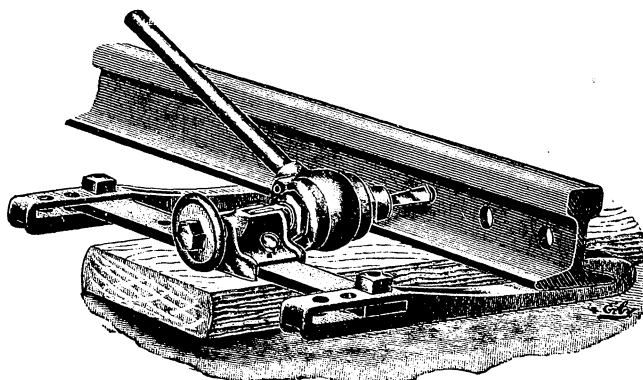


Fig. 2.—Golden Crown Ware in Use.

the highest grade, or the porcelain lining of superior quality, and that the new composition on the outside will not chip off.

**The Schuttler Ratchet Track Drill.**

The above drill, as illustrated herewith, is being handled by C. H. Tucker, Jr., & Brother, 126 Liberty street, New York, as sole agents for the Eastern States. All the parts are of first-class workmanship and the material of the best quality, cruci-



The Schuttler Ratchet Track Drill.

ble steel being employed for the working parts; the gears being cut, not cast. The working parts within the shell consist of four bevel-gear wheels, set at right angles to each other, pivoted to the shaft,



dogs or pawls engaging two of the gears in such a manner that the drill works continuously in one direction by the movement of the handle in both directions, thus effecting a saving of 50 per cent. The working parts are interchangeable, and the shell is of malleable iron, with the facings ground, perfectly protecting the working parts from water, sand and dirt. The shell is in two parts held together by nuts at each end and may readily be taken apart. The frame is adjustable both laterally and longitudinally, the entire weight of all being about 25 pounds. The forks are 20 inches long; the width or span of the carriage, 24 inches, and the lever handle 17 inches long. The carriage clamps are of malleable iron so distributed as to get the maximum strength with the minimum weight of metal employed. The movable bar at the back of the carriage is of tempered steel so arranged as not to take a permanent set. The drill is quickly attached to either the inside or outside of the rail without interfering with passing trains, and all holes can be drilled without readjusting the drill.

### The Davis Corkscrews.

Detroit Corkscrew Company, Detroit, Mich., are manufacturing a line of corkscrews, as illustrated in the accompanying cuts. The Davis corkscrew, Fig. 1, is made of steel, polished, nickel plated, and

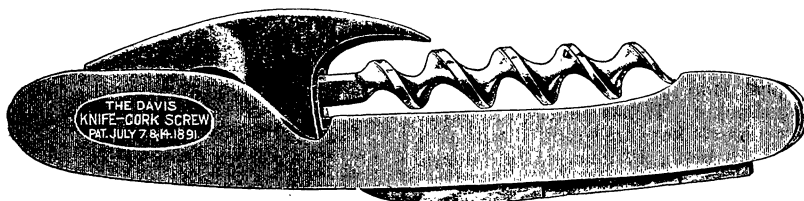


Fig. 1.—The Davis Corkscrew.

combines a pocket knife, wire cutter and lever corkscrew. In use the wire is cut, as in Fig. 2, with the wire-cutting fulcrum;

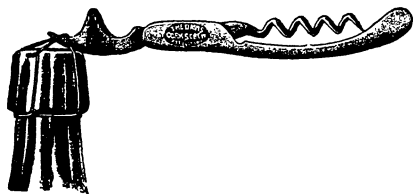


Fig. 2.—Cutting Wires on Bottle.

then the cork is pulled with the fulcrum in position, as in Fig. 3. The device is 4 inches long, with a knife blade 2 inches long, and is intended to be carried in the pocket. The knife blade is designed for

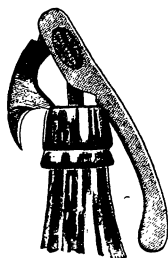


Fig. 3.—Drawing the Cork.

general use, or may be used exclusively for a fruit knife. This corkscrew is made in the same form without a blade, as shown in Fig. 2, of the same length as that in

Fig. 1, but proportionally lighter. The Puddefoot corkscrew, Fig. 4, is a folding pocket device, with a wire fulcrum to turn down in drawing the cork. These goods are neatly and substantially made, designed to fit any bottle, and may be operated by a woman or child. The com-

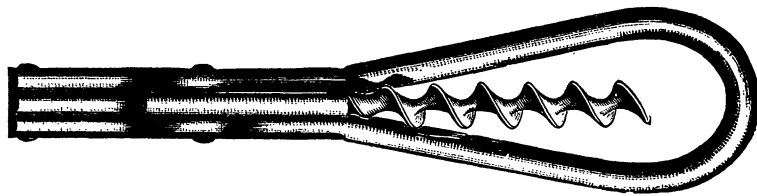


Fig. 4.—The Puddefoot Corkscrew.

pany have recently completed a machine for manufacturing the cut-worm screw, and are now in a position to compete with hand-made imported corkscrews.

### Trade Publications.

WE HAVE RECEIVED from Cleveland & Hardwick of Erie, Pa., a catalogue describing their stationary, detached, double, portable, semi-portable, combined and agricultural engines, and their stationary, portable and vertical boilers. They say: "Recognizing the fact that there is still a demand for the slide-valve engine, our intention is to furnish the very best at such figures as will warrant us in

the allowable pressure for single riveted boilers. Thus, a boiler 48 inches diameter, of  $\frac{3}{16}$  steel (0.3125), of 60,000 pounds tensile strength, would figure:

$$60,000 \times 0.3125 = 18,750.$$

Divide 18,750 by 24 and by 6 and we have 130 pounds, the United States Government allowance for such a boiler, single riveted.

We secure an additional allowance by double riveting, and hence there is an immense margin of safety properly allowed for corrosion, &c., in the after years of use.

THE PITTSBURGH STEEL CASTING COMPANY of Pittsburgh, Pa., has just issued a little pamphlet in response to a frequent request for their catalogue. It briefly describes their plant, which includes three furnaces for making crucible steel, with a capacity of 90 pots per heat. By using the product of one heat they are thus enabled to make castings having a net weight of 7,000 pounds. They have also an annealing plant of 14 furnaces, so arranged that two or more can be thrown into one, so that the largest castings that may be required can be readily annealed. The main foundry has a floor space of 256 x 122 feet, with two wings, while the machine shop is 60 x 200 feet, and they possess also a two-story iron-clad building for the storage of patterns for their customers. They suggest the use of crucible steel for hammer dies, chain dies, link dies and eye-bar dies for bridge builders, for the wearing parts of quartz mills, rock crushers, cams and rolls. They manufacture also steel balls used in pulverizing mills, which are first cast true to size and shape and subsequently forged under a heavy steel hammer. Among other specialties in crucible steel castings they produce a good deal of work in connection with the agricultural implement trade, having furnished last year over 50,000 plowshares. The Pittsburgh Steel Casting Company have always given a good deal of attention to the manufacture of Bessemer steel castings, which they claim are likely to be of better quality because the quantity of scrap used is not large. They point to the results of some tests made of their material. They make a specialty of Bessemer steel rolls, mill pinions and rolling-mill castings, gear wheels, pit-car wheels and castings for hydraulic machinery and for electric work.

THE NATIONAL GAS & WATER COMPANY of Chicago have just published a pamphlet descriptive of the process and the appliances for making fuel and illuminating gas by the Rew method. As already announced in *The Iron Age*, the apparatus is now in operation at Mattoon, and a second larger plant is under construction by the Cicero Gas Company to supply the western suburbs of Chicago. The pamphlet presents also an exhaustive report by Benjamin R. Catlin, former Principal Examiner in Gas Making and Metallurgy in the United States Patent Office, on the scope and validity of the Rew patents.

CAMBRIA IRON COMPANY, Gautier Steel Department, Johnstown, Pa., issue an exceedingly neat leather-covered pocket catalogue of their specialties in merchant steel. They manufacture numerous specialties, such as rake teeth, finger bars, drag-harrow teeth, spring harrow teeth, knife backs, seat springs, harrow discs, plow steel, plow shapes, cold rolled steel, &c. The catalogue comprises 63 pages, enumerating the various products of the company and giving valuable tables of weights of numerous sizes. Historical and statistical information of much interest relative to the company is also given. They maintain a New York office at 102 Chambers street, a Philadelphia office at Fifth and Commerce streets, and a Chicago office in room 209 Phenix Building.

The Hudson River ice harvest promises to reach 4,000,000 tons of the best quality. The Maine ice cutters are competing sharply. Ice and coal are, in one sense, yokefellows, though so diverse in character, for a demand for Eastern ice makes a return cargo for the colliers after discharge, and so helps to reduce freights.



# Current Hardware Prices.

JANUARY 25, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobber, at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

## Adjusters, Blind—

Domestic..... \$ doz \$3.00, 33%  
Excelsior..... \$ doz \$10.00..... 50&10&5  
North's..... list net @ 10%  
Zimmerman's—See Fasteners Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

### Anvils—

Eagle Anvils, # 10 04..... 15@15&5  
Peter Wright's..... 11@11%  
Arrington's Mouse Hole..... 10%@11%  
Am. Wrought, Horse shoe brand, 11@11%  
Trenton..... 10%@10%  
Wilkinson's..... 10%@11%  
Moore & Barnes Mfg. Co..... 33%

### Anvil Vise and Drill—

Millers Falls Co., \$18.00..... 20%  
Cheney Anvil and Vise..... 25%  
Allen Anvil and Vise, \$3.00..... 40&10%  
Star..... 45&5%

## Apple Parers—See Parers, Apple, &c.

### Augers and Bits—

Douglas Mfg. Co..... 75%  
Wm. A. Ives & Co.....  
Humphreysville Mfg. Co.....  
French, Swift & Co. (F. H. Beecher)  
P. S. & W. Co.....  
Rockford Bit Company.....  
Cook's, Douglas Mfg. Co.....  
Cook's, N. H. Copper Co.....  
Ives' Circular Lip.....  
Patent Solid Head.....  
C. E. Jennings & Co., No. 10, extension  
lip.....  
C. E. Jennings & Co., No. 30.....  
C. E. Jennings & Co., Auger Bits, set,  
32% quarter, No. 5, \$1.30, \$3.50, 25%  
Lewis' Patent Single twist.....  
Russell Jennings' Augers and Bits, 25&10%  
Imitation Jennings' Bits.....  
Pugh's Black.....  
Pugh's Jennings Pattern.....  
Car Bits, P. S. & W. Co.....  
Snell's Car Bits.....  
L'Hommedieu Car Bits.....  
Korstner Pat. Auger Bits.....  
Cincinnati Bell Hangers' Bits.....

### Bit Stock Drills—

Morse Twist Drills..... 50&10&5  
Standard..... 50&10&5  
Cleveland..... 50&10&5  
Syracuse, for metal..... 50&10%  
Syracuse, for wood (wood list), 30&80&5  
Cincinnati, for wood..... 30&10%  
Cincinnati, for metal..... 45&10%

### Expansive Bits—

Clark's small, \$18, large, \$26, 35@35&10%  
Ives' No. 4, \$ doz, \$80..... 40%  
Swan's..... 40%  
Stearns, No. 1, \$26; No. 2, \$22..... 35%  
Stearns' No. 2, \$48..... 20%

### Gimlet Bits—

Common..... \$ gross \$2.75@3.25  
Diamond..... \$ doz \$1.25..... 40&10%  
See..... 25@25&5  
Double Cut, Sheppardson's..... 45&45&10%  
Double Cut, Ct. Valley Mfg. Co..... 30&10%  
Double Cut, Hartwell's, \$ gro., \$5.00, 25%  
Double Cut, Douglass..... 40&10%  
Double Cut, Ives..... 60&60&10%

### Hollow Augers—

Ives'..... 33%@33%  
French, Swift & Co..... 41%  
Douglass'..... 41%  
Bonney's Adjustable, \$ doz \$48..... 50%  
Stearns'..... 20&10%  
Ives' Expansive, each \$4.50..... 50&5%  
Universal Expansive, each \$4.25..... 25&25&10%  
Wood's..... 25&25&10%  
Cincinnati Adjustable..... 25&10%  
Cincinnati Standard..... 25&10%

### Ship Augers and Bits—

L'Hommedieu's..... 15&10@15&10&5  
Watrous'..... 25&25&10%  
Snell's..... 15&10@15&10&5  
Snell's Ship Auger Pat'n Car Bits, 15&10@15&10&5

## Awl Hafts—See Hafts, Awl.

### Awls—

Awls, Sewing, Common..... \$ gr. 85¢@90¢  
Awls, Should. Peg..... \$ gr. 1.50@1.55  
Awls, Pat. Peg..... \$ gr. 35¢@38¢  
Awls, Shouldered Brad..... \$ gr. 1.30@1.40  
Awls, Handled Brad..... \$ gr. \$2.50@3.00  
Awls, Handled Scratch..... \$ gr. \$4.00@4.50  
Awls, Socket Scratch..... \$ doz \$1.10@1.20

## Awl and Tool Sets—See Sets, Awl and Tool.

### Axes—

Plain. Beveled.  
First quality, best brands, \$7.00..... \$7.50  
First qual., other brands..... 6.50 7.00  
Second quality..... 5.50 6.00

## Axle Grease—See Grease, Axle.

### Axles—

No. 1..... 34¢@44¢, No. 2, 5¢@8¢  
Nos. 7 to 14..... 60&10%  
Nos. 15 to 18..... 47%  
Nos. 19 to 22..... 70%  
Concord Axles, loose collar..... 44¢@50¢  
Concord Axles, solid collar..... 54¢@76¢  
National Tubular Self Oiling..... 33%@33%&5%

## Bag Holders—See Holders, Bag.

### Balances—

Spring Balances..... 40%  
No. 2000 20 30  
Chatillon, \$ doz..... \$0.80 0.95 1.75 net  
Chatillon Straight Balances..... 40%  
Chatillon Circular Balances..... 50&10%

## Barb Wire—See Wire, Barb.

### Bars—

Crow—  
Cast Steel..... \$ doz 3%  
Iron, Steel Points..... \$ doz 3%

### Basins, Wash—

Standard Fiberware, No. 1, 10% inch, \$2;  
12-inch, \$2.25 13% inch, \$2.75; 15-inch,  
\$3.25.

### Beams, Scale—

Scale Beams, List Jan. 12, '82, 50&10@  
50&10&5%  
Chatillon's No. 1..... 40%  
Chatillon's No. 2..... 50%  
Custer's..... 33%

### Beaters—

Egg—  
Dover..... \$ doz \$1.20@1.50  
Duplex (Standard Co.)..... \$ doz \$1.25  
Rival (Standard Co.)..... \$ doz \$1.00  
Duplex Extra Heavy (Standard Co.).....  
Bryant's..... \$ gross \$14.00  
Double (H. & R. Mfg. Co.), \$ gro., No. 0  
\$12.00; No. 1, \$15.00; No. 2..... \$36.00  
Easy (H. & R. Mfg. Co.)..... \$ gro \$12.00  
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50  
Spiral..... \$ gro \$4.25 @ \$4.50  
Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$9.00  
Paine, Diehl & Co.'s..... \$ gro \$24.00  
Silver & Co..... \$ doz \$5.50

### Cullinary—

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2..... 20%

### Bells—

Cow—  
Common Wrought..... 60&10%  
Western, Sargent's list..... 70&10%  
Kentucky, "Star"..... 20&10%  
Kentucky, Sargent's list..... 70&10%  
Kentucky Durham..... 70&10%  
Dodge, Genuine Kentucky..... 70&10%  
Texas Star..... 50&10@50&10&5%

### Door—

Gong, Abbe's..... 33%&10%  
Gong, Yankee..... 45&10%  
Gong, Barton's..... 40&10@50%  
Crane, Taylor's..... 25&10%  
Crane, Brooks'..... 50&10&5%  
Crane, Cone's..... 10%  
Crane, Connel's..... 20&10%  
Lever, Sargent's..... 60&10%  
Lever, Taylor's Bronzed or Plated..... net  
Lever, Taylor's Japanned..... 25&10%  
Lever, R. & E. Mfg. Co.'s..... 50&10&2%  
Pull, Brooks'..... 50&10&2%

### Electric—

Wollensak's..... 20%  
Bigelow & Dowse..... 20%  
Taylor's..... 20%

### Hand—

Light Brass..... 70&10@70&10&5%  
Extra Heavy..... 70%  
White..... 70%  
Silver Chime..... 33%&10%  
Globe Cone's Patent..... 25&10@35%

### Miscellaneous

Call..... 45@50%  
Farm Bells..... \$ 3¢@3%  
Steel Alloy Church and School Bells..... 40%

### Bellows—

Blacksmiths'..... 60&10&5@60&10&10%  
Molders'..... 40&10@50%  
Hand Bellows..... 40&10@50%

### Belting, Rubber—

Common Standard..... 70@10@75&5%  
Standard..... 70&5@70&10%  
Extra..... 60&10@60&10&5%  
N.Y.B. & P. Co., Carbon..... 60%  
N.Y.B. & P. Co., Diamond..... 50%  
N.Y.B. & P. Co., Para..... 40%

## Bench Stops—See Stops, Bench

## Benders and Upsetters, Tire

Stoddard's Lightning Tire Upsetters..... 15%  
Detroit Perfected Tire Bender..... 15%  
Green River Tire Benders and Upsetters..... 20%

### Bits—

Auger, Gimlet, Bit Stock Drills, &c.,  
see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

### Blocks—

Cleveland Block Co., Mal. Iron, 50@60&10%  
Moore's Novelty, Mal. Iron..... 50%  
Sure Grip Steel Tackle Blocks..... 25%

## Bolts—

### Carriage, Machine, &c.—

Com. list June 10, '84..... 75&10&5@80%  
Genuine Eagle, Norway, list Oct. '84.....  
80&5@80&10%  
Eagle, Norway, list Oct. '84..... 80%  
Phila. pattern, list Oct. 7, '84..... 80%  
R.B. & W., old list..... 70%  
Machine, list Jan. 1, 1890..... 80&10%  
Bolt Ends, list Jan. 1, 1890..... 80&10%

## Door and Shutter—

Cast Iron Barrel, Square, &c..... 70&10%  
Cast Iron Shutter Bolts..... 70&10%  
Cast Iron Chain (Sargent's list)..... 65&10%  
Ives' Patent Door Bolts, 60&10@60&10&5%  
Wrought Barrel..... 70&10@75%  
Wrought Square..... 70&10@75%  
Wrt Shutter, all iron, Stanley's.....  
60&10@60&10&10%  
Wrt Shutter, Brass Knob..... 50&50&5%  
Wrt Shutter, Sargent's list..... 60&10%  
Wrt Sunk Flush, Sargent's list..... 60&10%  
Wrt Sunk Flush, Stanley's list, 50&10&5%  
Wrt B. K. Flush, Co' mr..... 55&10%

## Stove and Plow—

Stove..... 60&10@60&10&5%  
Plow..... 60&10&50@60&10&10%  
R. B. & W., Plow..... 55%

## Tire—

Common, list Feb. 28, '83..... 65@65&5%  
Port Chester Bolt and Nut Company.....  
Empire list Feb. 28, '83..... 65%  
Keystone, Philadel., list Oct. '84..... 80%  
Norway, Phila., list Oct. '84..... 75%  
American Screw Company.....  
Norway, Phila., list Oct. 16, '84..... 75%  
Eagle, Phila., list Oct. 16, '84..... 80%  
Philadel., list Oct. 16, '84..... 80%  
Bay State, list Feb. 28, '83..... 65%  
R. B. & W., Philadel., list Oct. 16, '84..... 80%

## Borers, Tap—

Common and Ring..... 20&10%  
Ives' Tap Borers..... 33%&5%  
Enterprise Mfg. Co..... 20%  
Clark's..... 33%@35%

## Borax—

Per lb..... 9%@10%&

## Boring Machines—See Machines, Boring.

## Bow Pins—See Pins, Bow.

## Boxes, Wagon—

Per doz..... 2%&

## Braces—

American Bit Brace and Tool Co.....  
Nos. 10, 12, 20..... 60&10%  
Nos. 11, 21, 24, 27..... 70&10%  
Nos. 22, 23, 25..... 60&10&5%  
Nos. 13, 26, 36, 37..... 70&10&5%  
Amidon's.....  
Barker's Imp'd Plain..... 75&10@80%  
Barker's Imp. Nickeled..... 65&10@70%  
Ratchet..... 75&10@80%  
Eclipse Ratchet..... 60%  
Globe Jawed..... 40@40&10%  
Corner Brace..... 40@40&10%  
Universal, 8 in., \$2.10; 10 in..... \$2.25  
Buffalo Ball..... \$1.10@1.15  
Barber's.....  
Nos. 10 to 16..... 50&10%  
Nos. 30 to 33..... 50&10%  
Nos. 40 to 63..... 50&10@50&10&10%

Saxton's..... 75&10@80%  
Barker's Imp. Polished..... 65&10@70%  
Barker's Imp. Nickeled..... 65&10@70%  
Ratchet, Polished..... 60&10@60%  
Ratchet, Nickeled..... 40&10@50%  
Buffalo Ball..... net, \$1.10@1.15  
Bartholomew's.....  
Nos. 25, 27 and 30..... 50&10@60&5%  
Nos. 117, 118, 119..... 70@70&5%  
Common Ball, American..... \$1.00@1.10  
Fray's Genuine Spofford's..... 50&5@50&10%  
Fray's Nos. 70 to 120, 81 to 123, 207 to 414..... 50&10%  
Ives' New Haven Novelty..... 70@70&5%  
New Haven Ratchet..... 60&5@60&10%  
Barber Ratchet..... 60&5@60&10%  
Barber's..... 80&5%  
Spofford..... 60&5@60&10%  
Osgood's Ratchet..... 40&10@50%  
P. S. & W. Co., Peck's Patent..... 60%

## Brackets—

Shelf, plain..... 65@70%  
Regular, list..... 60&10@70&10%  
Shelf, fancy..... 70@70&10%  
Sargent's list..... 70@70&10%  
Other makes at a wide range of prices.

## Bright Wire Goods—See Wire.

## Broilers—

Hens' Self, 1 inch..... 0 10 9x11  
Basting, 1 per doz..... \$4.50 5.50 6.50  
New Haven..... 50%  
Wire Goods Co..... 65&10%  
Morgan Odorous..... \$ doz, \$12, 50%

## Buckets, Well—

Galvanized—  
Hill's..... \$ doz, 12 qt. \$4.25; 14 qt. \$5.25  
Iron Clad..... 12 qt. \$4.25@4.50  
Helwig's..... Band..... \$3.75  
Helwig's Wired Top..... \$ doz \$4.00

## Bull Rings—See Rings, Bull.

## Butcher's Cleavers—See Cleavers, Butcher's.

## Butts—

### Brass—

Wrought Brass..... 80@80&10%  
Cast Brass, Tiebout's..... 50%  
Cast Brass, Fast..... 33%&10%  
Cast Brass, Loose Joint..... 33%&10%

### Cast Iron—

Fast Joint, Narrow..... 50&10&5@60%  
Fast Joint, Broad..... 50&10@60%  
Loose Joint.....  
Loose Joint, Japanned.....  
Loose Joint, Jap. with Acorns.....  
Parliament Butts..... 75@75  
Mayer's Hinges..... 10%  
Loose Pin, Acorns.....  
Loose Pin, Acorns, Japanned.....  
Loose Pin, Acorns, Japanned,  
Plated Tips.....

## Wrought Steel—

Fast Joint, Narrow.....  
Fast Joint, Narrow.....  
Fast Joint, Broad.....  
Loose Joint, Broad.....  
Table Butts, Back Flaps, &c.....  
Inside Blind, Regular.....  
Inside Blind, Light.....  
Loose Pin.....  
Bronzed Wrought Butts..... 50@50&10%

## Calipers—See Compasses.

## Calks, Toe—

Gautier, One Prong, Blunt..... 54¢@64¢  
Burke's One Prong, Blunt..... 54¢@64¢  
Burke's, Two Prong, Blunt..... 74¢@84¢  
Burke's, One Prong, Sharp..... 84¢@94¢

## Can Openers—See Openers, Can.

## Caps—

### Percussion—

Hicks & Goldmark's and Union Metallic  
Cartridge Co..... \$ 1000  
F. L. Waterproof, 1-10's..... 35¢@37¢  
E. B. Trimmed Edge, 1-10's..... 47¢@50¢  
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47¢@50¢

### Primers—

Berdan Primers, \$1.00..... 2%  
B. L. Caps (Sturtevant Shells) \$1.00..... 2%  
All other Primers, \$1.20..... 2%

## Cards—

Watson's Cotton, Wool, Horse and  
File, list January 28, 1891..... 25%

## Carpet Stretchers—

See Stretchers, Carpet.

## Carpet Sweepers—

See Sweepers, Carpet.

## Cartridges—

Rim Fire Cartridges..... 50&5&2%  
Rim Fire Military..... 15&2%  
Cent. Fire, Pistol and Rifle..... 25&25&2%  
Cent. Fire, Military and Sporting..... 15&2&2%  
Blank Cartridges, except 22 and 32 cal.,  
additional 10% to above discounts.

Blank Cartridges, 22 cal., \$1.75..... 2%  
Blank Cartridges, 32 cal., \$3.50..... 2%  
Primed Shells and Bullets..... 15&5&2%  
B. B. Caps, Round Ball, \$1.75..... 2%  
B. B. Caps, Con. Ball, Swgd., \$2.00..... 2%

## Casters—

Bed..... } Brass..... 55@55&10%  
Plate..... } Others..... 60@60&10%  
Shallow Socket..... }  
Deep Socket..... } 40&10%  
Yale Casters, low list..... 45%  
Yale, Gem..... 70%  
Martin's Patent (Phoenix)..... 45&10@60&10%  
Payson's Anti-friction..... 70@70&10%  
Payson's Truck..... 60@60&10%  
Giant Truck Casters..... 35%  
Stationary Truck Casters..... 50&10%  
Socket Truck Casters..... 50&10@10%  
Gwinner's Common Sense..... 60%  
Gwinner's Hercules..... 60%

## Cattle Leaders—

See Leaders, Cattle.

## Cement—

Victor Elastic..... 5 n palls n 5¢

## Chain—

Trace, Wagon and Fancy Chains,  
List revised Oct. 15, 1892..... 60@60&10%  
American Coil, in cask lots,  
3-16 3/4 5-16 3/8 7-16 1/2 5/8 3/4  
\$7.60 5.30 4.45 3.80 3.65 3.50 3.40 3.25  
Less than cask lots, add 1¢@4¢ n  
German Coil, list July 12, 1892..... 60&10%  
German Halter Chain, list July 12, 1892..... 60@60&10%  
Covert Halter..... 60&10%  
Covert Traces..... 35&2%  
Covert Heel Chain..... 60&2%  
Onelda Halter Chain..... 60@60&5%  
Galvanized Pump Chain..... \$ n 5¢@8¢  
Jack Chain, Iron..... 80&10%  
Jack Chain, Brass..... 80%

## Chalk—

White, case lots, \$ gr 50¢; small lots, 52¢  
Red, case lots, \$ gr 67¢; small lots, 72¢  
Blue, case lots, \$ gr 75¢; small lots, 80¢  
See also Crayons



**Halters—**

Cover's Rope, Jute.....60&10&10&25  
 Cover's Rope, 7-16 in. Jute.....70&25  
 Cover's Rope, 1/2 in. Hemp.....50&25  
 Cover's Ad. Rope Halters.....40&25  
 Cover's Hemp Horse and Cattle Tie.....50&10&25  
 Cover's Jute Horse Ties.....70&25  
 Cover's Jute Cattle Ties.....70&10&25  
 Cover's Ad. Web Halters.....35&5&25  
 Cover's Saddlery Works Halters.....33&25  
 Cover's Saddlery Works Horse and Cattle Ties.....33&25

**Hammers—**

**Handled Hammers—**  
 Maydole's, list Dec. 1, '85.....25&10&35  
 Buffalo Hammer Co.....50&10  
 Humason & Beckley.....50&10  
 Aha Tool Co.....40&10  
 Verree.....40&10  
 C. Hammond & Son.....40&10  
 Fayette R. Plumb.....40&10  
 Artisans Choice, A. E. Nail.....40&10  
 Regular Y. & P. A. E. Nail.....50  
 Horseshoe Turning Hammers.....50  
 Other Hammers.....50&10  
 Cheney's Claw.....40&10  
 Cheney's Machinist's & Riveting.....50&25  
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....30&10  
 Nelson Tool Works.....40&10  
 Warner & Nobles, new list.....25&10  
 Peck, Stow & Wilcox.....40&10  
 Sargent's.....40&10

**Heavy Hammers and Sledges—**

8 lb and under.....75&10  
 10 to 15 lb.....75&10  
 Over 15 lb.....85  
 Wilkinson's Smiths.....10&10

**Handcuffs and Leg Irons—**

See Police Goods.

**Handles—****Cross-Cut Saw Handles—**

Atkins No. 1 Loop, wpr., 28¢; No. 3, 18¢; No. 6, 15¢; No. 2 and No. 4, Reversible, 18¢.  
 Champion.....15¢  
 Ely's Perfection.....\$ doz., \$3.00

**Iron, Wrought or Cast—**

Door or Thumb.....0 1 2 3 4  
 Per doz.....\$0.90 1.00 1.08 1.35 1.50

**Wood—**

Saw and Plane.....40&10  
 Hammer, Hatchet, Axe, &c.....40&10  
 Brad Axl.....\$ gr 2.00  
 Hickory Firmer Chisel, ass'd.....\$ gr 4.50  
 Hickory Firmer Chisel, large.....\$ gr 5.00  
 Apple Firmer Chisel, ass'd.....\$ gr 5.00  
 Apple Firmer Chisel, large.....\$ gr 6.00  
 Socket Firmer Chisel, ass'd.....\$ gr 5.00  
 Socket Framing Chisel, ass'd.....\$ gr 5.00  
 J. B. Smith & Co's Pat. File.....50¢  
 File, assorted.....\$ gr 2.00  
 Auger, assorted.....\$ gr 5.00  
 Auger, large.....\$ gr 7.00  
 Pat. Auger, Ives'.....30&10  
 Pat. Auger, Douglass.....\$ set \$1.25  
 Pat. Auger, Swan's.....\$ set \$1.00  
 Hoe, Rake, Shovel, &c.....60&10

**Hangers—**

Barn Door, old patterns.....70&70  
 Barn Door, New England.....70&70  
 Samson Steel Anti-Friction.....55  
 Orleans Steel.....55  
 Hamilton Wrought Steel Track.....55  
 U. S. Wood Track.....60&10  
 Champion.....60&10  
 Rider and Wooster, Medina Mfg. Co's list.....70  
 Climax Anti-Friction.....55  
 Climax Anti-Friction for Wood Track.....55  
 Zenith for Wood Track.....55  
 Reed's Steel Arm.....50  
 Challenge, Barn Door.....50  
 Sterling.....50&10  
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....50&25  
 Cheritree.....50  
 Kicker's.....50  
 Boss.....60&10  
 Best Anti-Friction.....60&10  
 Duplex (Wood Track).....60&10  
 Terry's Modern Anti-Friction (all steel).....50&10  
 Terry's Ideal Anti-Friction (all steel).....50&10  
 Terry's Solid Anti-Friction (all steel).....60&10  
 Terry's Shield Anti-Friction (all steel).....60&10  
 Terry's Wrought Single Strap.....50&10  
 Cronk's Patent, Steel Covered.....50&10  
 Wood Track Iron Clad, ft. 10.....50  
 Carrier Steel Anti-Friction.....50&10  
 Architect, set \$8.00.....20  
 Eclipse, set \$4.50.....20  
 Richards.....20  
 Lane's New Standard.....50  
 Lane's Standard.....50  
 Lane's Parlor.....40  
 Ball Bearing Door Hanger.....20&10  
 Warner's Pat.....20&10  
 Stearns' Anti-Friction.....20&10  
 Stearns' Challenge.....25&10  
 Faultless.....40  
 American, per set \$6.00.....20&10  
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....40  
 Paragon, Nos. 1, 2 and 3.....40&10  
 Cincinnati.....25&10  
 Paragon, Nos. 6, 7 and 8.....60&10  
 Crescent.....60&10  
 Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15.....40  
 Seranton Anti-Friction Single Strap.....33&25  
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....45  
 Star.....40&10  
 May.....40&10  
 Barry, \$6.00.....40&10  
 Interstate.....50  
 Macic.....40  
 Pendulum, Pavson's.....40&10  
 Moody.....40

**Hangers—**

**Hatchets—**  
 American Axe and Tool Co.  
 Blood's.....50  
 Hunt's.....50  
 Ford's.....50  
 Mann's.....50  
 Peck's.....50  
 Underhill's.....40 & 10  
 Buffalo Hammer Co.....50&5  
 Fayette R. Plumb.....50  
 C. Hammond & Son.....50  
 Kelly's.....50  
 Sargent's & Co.....50  
 S. & W. Co.....50  
 Ten Eyck Edge Tool Co.....10  
 Collins.....50  
 Schulte, Lohoff & Co.....50&5

**Hay and Straw Knives—**  
 See Knives.

**Hinges—**  
**Blind Hinges—**  
 Parker.....75&25  
 Huffer.....80  
 Niagara.....80  
 Clark's Nos. 1, 3, 5, 40 and 50, 80&80  
 Clark's Mortise Gravity.....50  
 Sargent's Nos. 1, 3, 5, 11, 12, 13, 75&10  
 Reading's Gravity.....75&10  
 Shepard's.....75&10  
 Noiseless.....75&10  
 Buffalo.....80  
 Clark's Genuine Pattern.....80  
 O. S. Lull & Porter.....75&10  
 Acme, Lull & Porter.....75  
 Queen City Reversible.....70&10  
 Clark's, Lull & Porter, Nos. 1, 2, 3, 5, 11, 12, 13, 75&10  
 North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....10

**Gate Hinges—**  
 Western.....\$ doz \$4.20, 60&80  
 N. E. Reversible \$ doz \$5.60, 80&100  
 Clark's, Nos. 1, 2, 3.....60&10  
 N. Y. State.....\$ doz \$4.90, 60&10  
 Automatic.....\$ doz \$12.50, 50  
 Shepard's.....60&10

**Spring Hinges—**  
 Geer's Spring and Blank Butts.....40  
 Union Spring Hinge Co's list, March, 1886.....20  
 Barker's Double Acting.....25  
 Union Mfg. Co.....25  
 Bommer's.....30  
 Buckman's.....15  
 Chicago.....30  
 Bardsley's Patent Checking.....15  
 Acme.....30  
 U. S.....25  
 Empire and Crown.....20  
 Hero and Monarch.....55  
 American, Gem and Star.....20  
 Oxford.....20  
 Royal.....60  
 Reliable.....60  
 Champion.....60  
 No. 10 Matchless.....60  
 No. 25 Unbreakable.....60  
 J. G. C. Covered, \$ gr. \$30.....50&5  
 Samson.....60  
 Wiles', No. 1, \$ gr. \$10; No. 2.....\$13  
 Rorex, No. 1.....\$ gr. \$13.00  
 Rex.....\$ gr. \$12.00  
 Freeport.....\$ gr. \$12.00

**Wrought Iron Hinges—**  
 List February 14, 1891.  
 Strap and T.....50&10  
 Corrugated Strap and T.....50&10  
 Screw Hook and Eye.....\$ 6 to 12 in., \$ m. 4¢  
 Strap.....\$ 12 to 20 in., \$ m. 3¢  
 \$ 22 to 36 in., \$ m. 3¢  
 \$ 36 in., \$ m. 3¢  
 \$ 42 in., \$ m. 4¢  
 \$ 48 in., \$ m. 4¢  
 \$ 54 in., \$ m. 4¢  
 \$ 60 in., \$ m. 4¢  
 \$ 66 in., \$ m. 4¢  
 \$ 72 in., \$ m. 4¢  
 \$ 78 in., \$ m. 4¢  
 \$ 84 in., \$ m. 4¢  
 \$ 90 in., \$ m. 4¢  
 \$ 96 in., \$ m. 4¢  
 \$ 102 in., \$ m. 4¢  
 \$ 108 in., \$ m. 4¢  
 \$ 114 in., \$ m. 4¢  
 \$ 120 in., \$ m. 4¢  
 \$ 126 in., \$ m. 4¢  
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 \$ 870 in., \$ m. 4¢  
 \$ 876 in., \$ m. 4¢  
 \$ 882 in., \$ m. 4¢  
 \$ 888 in., \$ m. 4¢  
 \$ 894 in., \$ m. 4¢  
 \$ 900 in., \$ m. 4¢  
 \$ 906 in., \$ m. 4¢  
 \$ 912 in., \$ m. 4¢  
 \$ 918 in., \$ m. 4¢  
 \$ 924 in., \$ m. 4¢  
 \$ 930 in., \$ m. 4¢  
 \$ 936 in., \$ m. 4¢  
 \$ 942 in., \$ m. 4¢  
 \$ 948 in., \$ m. 4¢  
 \$ 954 in., \$ m. 4¢  
 \$ 960 in., \$ m. 4¢  
 \$ 966 in., \$ m. 4¢  
 \$ 972 in., \$ m. 4¢  
 \$ 978 in., \$ m. 4¢  
 \$ 984 in., \$ m. 4¢  
 \$ 990 in., \$ m. 4¢  
 \$ 996 in., \$ m. 4¢  
 \$ 1000 in., \$ m. 4¢

**Hatchets—**

American Axe and Tool Co.  
 Blood's.....50  
 Hunt's.....50  
 Ford's.....50  
 Mann's.....50  
 Peck's.....50  
 Underhill's.....40 & 10  
 Buffalo Hammer Co.....50&5  
 Fayette R. Plumb.....50  
 C. Hammond & Son.....50  
 Kelly's.....50  
 Sargent's & Co.....50  
 S. & W. Co.....50  
 Ten Eyck Edge Tool Co.....10  
 Collins.....50  
 Schulte, Lohoff & Co.....50&5

**Hay and Straw Knives—**

See Knives.

**Hinges—****Blind Hinges—**

Parker.....75&25  
 Huffer.....80  
 Niagara.....80  
 Clark's Nos. 1, 3, 5, 40 and 50, 80&80  
 Clark's Mortise Gravity.....50  
 Sargent's Nos. 1, 3, 5, 11, 12, 13, 75&10  
 Reading's Gravity.....75&10  
 Shepard's.....75&10  
 Noiseless.....75&10  
 Buffalo.....80  
 Clark's Genuine Pattern.....80  
 O. S. Lull & Porter.....75&10  
 Acme, Lull & Porter.....75  
 Queen City Reversible.....70&10  
 Clark's, Lull & Porter, Nos. 1, 2, 3, 5, 11, 12, 13, 75&10  
 North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....10

**Gate Hinges—**

Western.....\$ doz \$4.20, 60&80  
 N. E. Reversible \$ doz \$5.60, 80&100  
 Clark's, Nos. 1, 2, 3.....60&10  
 N. Y. State.....\$ doz \$4.90, 60&10  
 Automatic.....\$ doz \$12.50, 50  
 Shepard's.....60&10

**Spring Hinges—**

Geer's Spring and Blank Butts.....40  
 Union Spring Hinge Co's list, March, 1886.....20  
 Barker's Double Acting.....25  
 Union Mfg. Co.....25  
 Bommer's.....30  
 Buckman's.....15  
 Chicago.....30  
 Bardsley's Patent Checking.....15  
 Acme.....30  
 U. S.....25  
 Empire and Crown.....20  
 Hero and Monarch.....55  
 American, Gem and Star.....20  
 Oxford.....20  
 Royal.....60  
 Reliable.....60  
 Champion.....60  
 No. 10 Matchless.....60  
 No. 25 Unbreakable.....60  
 J. G. C. Covered, \$ gr. \$30.....50&5  
 Samson.....60  
 Wiles', No. 1, \$ gr. \$10; No. 2.....\$13  
 Rorex, No. 1.....\$ gr. \$13.00  
 Rex.....\$ gr. \$12.00  
 Freeport.....\$ gr. \$12.00

**Wrought Iron Hinges—**

List February 14, 1891.  
 Strap and T.....50&10  
 Corrugated Strap and T.....50&10  
 Screw Hook and Eye.....\$ 6 to 12 in., \$ m. 4¢  
 Strap.....\$ 12 to 20 in., \$ m. 3¢  
 \$ 22 to 36 in., \$ m. 3¢  
 \$ 36 in., \$ m. 3¢  
 \$ 42 in., \$ m. 4¢  
 \$ 48 in., \$ m. 4¢  
 \$ 54 in., \$ m. 4¢  
 \$ 60 in., \$ m. 4¢  
 \$ 66 in., \$ m. 4¢  
 \$ 72 in., \$ m. 4¢  
 \$ 78 in., \$ m. 4¢  
 \$ 84 in., \$ m. 4¢  
 \$ 90 in., \$ m. 4¢  
 \$ 96 in., \$ m. 4¢  
 \$ 102 in., \$ m. 4¢  
 \$ 108 in., \$ m. 4¢  
 \$ 114 in., \$ m. 4¢  
 \$ 120 in., \$ m. 4¢  
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**Hoes—**

D. & H. Scovill.....20  
 Lane's Crescent, Planters' Pattern.....45&5  
 Lane's Razor Blade, Scovill Pattern.....30  
 Maynard, S. & O. Pat.....45&5  
 Sandusky Tool Co., S. & O. Pat.....70&70  
 Am. Axe and Tool Co., S. & O. Pat.....5  
 Chattanooga Tool Co., S. & O. Pat.....60  
 Grub.....60&10

**Handled—**

Garden, Mortar, &c.....70&70  
 Planter's, Cotton, &c.....70&70  
 Warren Hoe.....60&80  
 Magic.....\$ doz \$4.00

**Hog Rings and Ringers—**

See Rings and Ringers.

**Hoisting Apparatus—**

See Machines, Hoisting.

**Hollow-Ware—**

See Ware, Hollow.

**Holders—****Bag—**

Sprengle's Pat.....\$ doz \$18.....60

**Bit—**

Extension.....\$ doz \$15.00.....40  
 Barber's.....\$ doz \$20.00.....60  
 Ives, \$ doz \$20.00.....60  
 Diagonal.....\$ doz \$24.00.....40  
 Angular.....\$ doz \$24.00.....40

**File and Tool—**

Balz Pat.....\$ doz \$4.00.....25  
 Nicholson's File Holders.....20  
 Dick's Tool Holder.....20

**Hooks—**

**Meat Cutters—**  
See *Cutters, Meat.*

N. Y. B. & P. Co., Salamander.....25%  
Jenkins' Standard, # 10 80¢....25@25&5%

**Miscellaneous—**

Co.).....	25&10%
Steers' Iron Planes.....	40&10%
Meriden Mal. Iron Co.'s.....	40@40&10%
Davis' Iron Planes.....	40@40&10%

Duck, 25-lb kegs.....	8.50
Duck, 12½-lb kegs .....	2.75
Duck 6½ lb kegs.....	1.50



**Presses—**

<b>Fruit and Jelly—</b>	
Enterprise Mfg. Co.	25%
Henis	doz \$3.50
Shepard's Queen City	40%
Silver & Co.	doz \$2.75

**Pruning Hooks and Shears—See Shears.****Pullers, Nail—**

Scranton	doz, \$18.00, 33%
Curtis Hammer	doz, \$9.00
Giant, No. 1	doz, \$18.00, 10%
Giant, No. 2	doz, \$15.00, 10%
Pelican	doz, \$9.00, 25%
Eclipse	Each, \$2.00, net
Economy	doz, \$6.00

**Pulleys—**

Hot House, Awning, &c.	68% @ 70%
Japanned Screw	60% @ 10%
Brass Screw	70%
Japanned Slide	60% @ 10%
Japanned Clothes Line	60% @ 10%
Moore's Sash, Anti-Friction	50%
Hay Fork, Solid Eye, 4.00	50%
Hay Fork, "Anti-Friction" 5 in. solid	50%
Hay Fork, "F" Common and Patent	50%
Bushed	20%
Hay Fork, Tarbox Pat. Iron	20%
Hay Fork, Reed's Self-Lubricating	45%
Shade Rack	45%
Tackle Blocks—See Blocks	
Moore's Anti-Friction 5 in. Wheel	40%
doz, \$12.00	40%
Shepard's Niagara, No. 25	80%
Sash (Auger M. Use)	80%
Common Sense	60%
Empire	60%
Ideal	60%
Acme	60% less 1¢ doz net
Star	60%
On bbl. lots extra 5%.	

**Pumps—**

Cistern, Best Makers	60% @ 60% @ 10%
Pitcher Spout, Best Makers	67% @ 70%
Pitcher Spout, Cheaper G'ds	75% @ 75% @ 10%

**Punches—**

Saddler's or Drive, good	doz, 60% @ 65%
Bemis & Call Co.'s Cast Steel Drive, 50%	65%
Bemis & Call Co.'s Springfield Socket	65%
Spring, good quality	doz, \$2.50 @ \$2.80
Spring, Leach's Pat	15%
Bemis & Call Co.'s Spring and Check	40%
Solid Timmers, P. S. & W. Co., doz	\$1.44
Timmers' Hollow Punches, P. S. & W. Co.	20% @ 2%
Rice Hand Punches, Black	45%
Avery's Revolving	40%
Avery's Sawset and Punch—See Sawsets	

**Rail—**

Sliding Door, Wrt Brass	doz, 35¢, 40%
Sliding Door, Bronzed Wrt Iron	ft, 7¢
Sliding Door, Iron, Painted	ft, 4¢, 40%
Barn Door, Light, In	3¢
Per 100 feet	\$2.00 2.60 3.10, 10%
B. D. for N. E. Hangers	
Small, Med. Large	
Per 100 feet	\$3.15 2.70 3.25 Net
Terry's Steel Rail	ft, 4¢
Victor Track Rail, 7¢ foot	50% @ 2%
Carrier, double braced, Steel Rail	foot, 4¢
Moore's Wrought Iron	3¢ @ 4¢
Moody Steel Rail, ft, 5¢	45%

**Rakes—**

Cast Steel, Association rds.	70% @ 70% @ 2%
Cast Steel, outside g'ds	70% @ 70% @ 2%
Malleable	70% @ 70% @ 2%
Gibbs' Lawn Rake	doz, \$4.90
Gibbs' Canton Lawn Rake	doz, \$3.75
Gibbs' Acme Lawn Rake	doz, \$4.75
Gibbs' Favorite Lawn Rake	doz, \$3.90
Gibbs' Crown Lawn Rake, No. 1	doz, \$4.90, No. 2, \$5.40
Oneida Lawn Rake	doz, \$6.00
Fort Madison Prize Bow Brace and	Peerless
Fort Madison Steel Tooth Lawn Rake	\$6.00

**Razors—**

J. R. Torrey Razor Co.	20%
Wostenholm and Butcher, \$10 to 2	10%
Jordan's A. A. New	70% @ 1%
Jordan's Old Faithful, new list	Net
Galvanic	doz, \$15.00
Electric Cutlery Co.	Net
Campbell Cutlery Co.	50%

**Razor Strogs—**

See Strogs, Razor.

**Rings and Ringers—****Bull Rings—**

Union Nut Co.	55%
Sargent's	75% @ 10%
Hotchkiss' low key	30%
Humason, Beckley & Co.	70% @ 1%
Peck, Stow & W. Co.'s	50% @ 10% @ 50% @ 10%
Ellrich Hd. Co., White Metal, low list	50% @ 50% @ 10%

**Hog—**

Top of the Hill Ringers	doz \$2.00
Top of the Hill Ringers	doz \$1.25
Hill's Improved Ringers	doz \$1.25
Hill's Old Style Ringers	doz \$1.25
Hill's Tongs	doz \$3.00
Hill's Ringers	doz bxs \$1.00
Perfect Ringers	doz bxs \$1.50
Perfect Ringers	doz \$2.15 @ \$2.25
Blair's Hog Ringers	doz \$2.00
Blair's Hog Ringers	doz 90¢ @ \$1.00
Champion Ringers	doz \$2.25
Brown's Ringers	doz \$2.00
Brown's Ringers	doz \$1.15 @ \$1.25
Electric Hog Ringers	doz boxes \$1.50
Electric Hog Ringers	doz \$2.00
Major Ringers	doz \$1.25
Major Ringers	doz \$2.00

**Rivets and Burrs—**

Iron, lat Nov. 17, '87	60% @ 10%
Copper	60% @ 10%
Coppered Iron, Bettina Brand	40%

**Rivet Sets—See Sets.****Rods—**

Stair, Brass	25% @ 30%
Stair, Black Walnut	doz 40%

**Rollers—**

Barn Door, Sargent's list	60% @ 10% @ 10%
Acme Moore's Anti-Friction	50%
Union Barn Door Roller	70%
Thompson Mfg. Co.'s awn Roll re	30%

**Rope**—The following prices are f.o.b. New York or factory, and are shaded 1/4% off on large lots; terms, 1 1/4% for cash.

Manila, 7-16 in. diam. and larger	doz 93%
Manila, 3/4 in.	doz 103%
Manila, 1/2 and 5-16 in.	doz 104%
Manila, Tarred Rope	doz 94%
Manila, Hay Rope	doz 94%
Sisal, 7-16 inch and larger	doz 75%
Sisal, 3/4 in.	doz 80%
Sisal, 1/2 and 5-16 in.	doz 85%
Sisal, Hay Rope	doz 75%
Sisal, Tarred Rope	doz 75%
Sisal, Medium Lath Yarn	doz 75%
New Zealand, 7-16 in. & larger	doz 64%
New Zealand, 3/4 inch	doz 71%
New Zealand, 1/2 and 5-16 inch	doz 74%
New Zealand, Hay Rope	doz 64%
New Zealand, Tarred Rope	doz 64%
Cotton Rope	doz 13%
Jute Rope	doz 61% @ 7%

**Wire—**

List February, 1892. All kinds. 45%

**Rules—**

Boxwood	80% @ 10%
Hay Fork	50% @ 10%
Starrett's Rules and Straight Edges	25% @ 10%

**Sad Irons—See Irons, Sad.****Sand and Emery Paper and Cloth—**  
See Paper and Cloth.**Sash Cord—See Cord, Sash.****Sash Locks—See Locks, Sash.****Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.****Saws—** The following prices are generally cut by jobbers.

Disston's Circular	45% @ 45% @ 5%
Disston's Cross Cut	45% @ 45% @ 5%
Disston's Hand	25%
Woodruff & McParlin	
Hand, Panel and Rip	30% @ 30% @ 5%
Narrow Champion Cross Cuts with	Handles, 18¢ @ 20¢
Champion Thin Back Cross Cuts,	foot
Champion Extra Thin Back Cross	Cuts, 29¢ @ 31¢
One Man Champion Cross Cuts,	foot
Wheeler, Madden & Clemson Mfg. Co.	
Hand, Panel and Rip	35% @ 35% @ 5%
Narrow Champion Cross Cuts with	Handles, 18¢ @ 20¢
Champion Thin Back Cross Cuts,	foot
Champion Extra Thin Back Cross	Cuts, 29¢ @ 31¢
One Man Champion Cross Cuts,	ft.
Atkins' Circular Shingle & Heading	50%
Atkins' Silver Steel Diamond X Cuts	foot 70¢
Atkins' Special Steel Dexter X Cuts	foot 50¢
Atkins' Special Steel Diamond X Cuts	foot 32¢
Atkins' Champion and Electric Tooth	X Cuts, foot 30¢
Atkins' Hollow Back X Cuts	foot 20¢
Atkins' Mulay, Mill and Drag	40%
Atkins' One-Man Saw, with handles,	foot 40¢
Peace Circular and Mill	45% @ 45% @ 5%
Peace Hand Panel and Rip	25% @ 25% @ 5%
Peace Cross Cuts	45% @ 45% @ 5%
Richardson's Circular and Mill	45% @ 45% @ 5%
Richardson's X Cuts	45% @ 45% @ 5%
Richardson's Hand, &c.	25% @ 25% @ 5%
C. E. Jennings & Co. Hand, Panel	and Rip

**Hack Saws—**

Griffin's complete	40% @ 10% @ 50%
Jordan's Hack Saw Blades	40% @ 10% @ 50%
Star Hack Saws and Blades	25%
Eureka and Crescent	25%

**Scroll—**

Lester, complete	\$10.00
Rogers, complete	\$4.00
Barnes' Builders' and Cab Makers'	\$15.25
Barnes' Scroll Saw Blades	35%

**Saw Frames—**

See Frames, Saw.

**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Scales—**

Hatch, Counter, No. 171, good quality	doz \$18.00 @ \$19.00
Hatch, Tea, No. 161	doz \$6.50 @ \$7.00
Union Platform, Plain	\$2.10 @ 2.20
Union Platform, Striped	\$2.40 @ 2.50
Chattillon's Grocers' Trip Scales	50%
Chattillon's Eureka	25%
Chattillon's Favorite	40%
Family, Turnbills	30% @ 30% @ 10%
Riehle Bros' Platform	40%

**Scale Beams—**

See Beams, Scale.

**Scissors, Fluting** 45%**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.)	30% @ 10%
Box, 1 Handle	doz \$2.25 @ \$2.50
Box, 2 Handle	doz \$3.00 @ \$3.25
Defence Box and Ship	20% @ 10%
Foot	50% @ 10% @ 80%
Ship, Common	doz \$3.50 net
Ship, R. I. Tool Co.	10%

**Screen Window and Door Frames—See Frames****Screw Drivers—**

See Drivers, Screw

**Screws—****Bench and Hand—**

Bench, Iron	55% @ 55% @ 10%
Bench, Wood, Beech	doz \$2.25
Bench, Wood, Hickory	20% @ 10%
Hand, Wood	25% @ 25% @ 10% @ 5%
Hand, Grand Rapids, list	35%

**Coach, Lag and Hand-Rail—**

Lag, Blunt Point, list Jan. 1, 1890	80% @ 80% @ 10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890	80% @ 80% @ 5%
Hand Rail, H. & B. Mfg. Co.	70% @ 10%
Hand Rail, Am. Screw Co.	75%

**Jack Screws—**

Jack Screws, Millers Falls list	50% @ 50% @ 10%
Jack Screws, P. S. & W.	35%
Jack Screws, Sargent	70%
Jack Screws, Stearns	40% @ 40% @ 10%

**Cork—**

Humason & Beckley Mfg. Co.	40% @ 10% @ 50%
Williamson's	33% @ 33% @ 5%

**Machine—**

Flat Head Iron	65%
Round Head Iron	60%

**Wood—**

List January 1, 1891.	
Flat Head Iron	70%
Round Head Iron	65%
Flat Head Brass	70%
Round Head Brass	65%
Flat Head, Bronze	70%
Round Head, Bronze	65%
Rogers' Drive Screws	82%

**Scroll Saws—See Saws, Scroll.****Scythes—**

Grain	40% @ 50% @ 40% @ 10%
Grass	40% @ 10% @ 50%

**Scythe Snaths—**

See Snaths, Scythe.

**Sets—****Awl and Tool—**

Aiken's Sets, Awls and Tools	
No. 20, doz \$10.00	60% @ 60% @ 5%
Fray's Adj. Tool Hds., Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	45%
Miller's Falls Adj. Tool Hds.	
Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	25%
Henry's Combination Haft	doz \$6.50
Stanley's Excelsior	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50	30% @ 10%
Common Sets	
No. 42, \$10.50; No. 43, \$12.50	70% @ 10% @ 5%

**Nail—**

Square	gr. \$4.00 @ \$4.25
Round	gr. \$3.25
Buck Bros	27%
Cannon's Diamond Point	gr. \$12, 20%

**Rivet—**

Regular list	70%
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**Saw—**

Stillman's Genuine	doz \$5.00 @ 7.75, 40% @ 5%
Stillman's Pattern, Hand	doz \$3.25, 55%
Cross Cut, \$5.25	55%
Common Lever	doz \$2.00, 45% @ 50%
Morrill's No. 1	\$15.00, 40% @ 20%
No. 1, \$15.00	40% @ 10% @ 40% @ 5%
No. 3 and \$18.00	40% @ 5%
No. 5, \$24.00	40% @ 5%
Leach's, No. 0, \$8.00; No. 1, \$15.00	15% @ 20%
Nash's	20% @ 10% @ 20% @ 10%
Hammer, Hotchkiss	\$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.	30% @ 5%
Bemis & Call Co.'s Lever and Spring	Hammer
Bemis & Call Co.'s Plate	10%
Bemis & Call Co.'s Cross Cut	12%
Aiken's Genuine	\$13.00, 60% @ 10% @ 60%
Aiken's Imitation	\$7.00, 55% @ 5%
Bart's Pat. Lever	40% @ 10%
Disston's Star	25%
Leopold	40% @ 10% @ 50%
Atkin's Lever	doz No. 1, \$6.00
Atkin's Criterion	doz No. 1, \$8.00
Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00	40% @ 10%
Avery's Saw and Punch	50%
Kaiser's Royal	doz \$7.50
Kohler's Giant Royal	doz \$12.00
Crescent	doz \$3.00
Lloyd's Acme	doz \$15, 40% @ 10%
Taintor Positive	doz \$18, 50%

**Sharpeners, Knife—**

Larkins'	
Applewood Handles	doz \$6.00, 40%
Rosewood or Cocobola	doz \$9.00, 40%

**Shaves, Spoke—**

Wood	45%
Wood, Beech	30%
Walley's (Stanley R. & L. Co.)	40% @ 10%
Stearns	30% @ 10%
Cincinnati	25% @ 10%
Goodell's	doz \$9.



**Snaps, Harness, &c.**

Anchor (T. & S. Mfg. Co.)	65¢
Fitch's (Bristol)	50¢10¢
Hochkiss	10¢
Andrews	60¢
Sargent's Patent Guarded	70¢10¢10¢
German, new list	40¢10¢
Covert	50¢10¢5¢2¢
Covert, New Patent	60¢10¢5¢2¢
Covert, New R. E.	60¢10¢5¢2¢
Covered Spring	60¢10¢10¢
Covert's Saddlery Works' Triumph	33¢1¢
John Protz Snaps	75¢75¢5¢

**Snaths, Scythe**

List	50¢50¢5¢
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**Soldering Irons**See *Irons, Soldering.***Spittoons, Cuspidors, &c.**

Standard Fiberware—	
Cuspidors, 8½-inch, doz., No. 5, \$8; No. 52, \$9.	
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, \$8.	

**Spoke Shaves**See *Shaves, Spoke.***Spoke Trimmers**See *Trimmers, Spoke.***Spoons and Forks**

Tinned Iron—

Basting, Cen. Stamp, Co.'s list	70¢10¢
Solid Table and Tea, Cen. Stamp, Co.'s list	70¢10¢
Buffalo, S. S. & Co.	33¢1¢2¢

**Silver Plated**

months or 5% cash 30 days:	
Meriden Brit. Co., Rogers	40¢15¢
C. Rogers & Bros.	40¢15¢
Rogers & Bros.	40¢15¢
Reed & Barton	40¢40¢5¢
Wm. Rogers Mfg. Co.	40, 15¢5¢
Simpson, Hall, Miller & Co.	40, 15¢5¢
Holmes & Edwards Silver Co.	40, 15¢5¢
L. Boardman & Son	50¢12¢5¢

**Miscellaneous**

Holmes & Edwards Silver Co.—	
No. 87 Mexican Silver	50¢10¢5¢
No. 30 Silver Metal	50¢10¢5¢
No. 24 German Silver	50¢10¢5¢
No. 50 Nickel Silver	50¢10¢5¢
No. 49 Nickel Silver	50¢10¢5¢
Wm. Rogers Mfg. Co.:—	
Rogers' Silver Metal	50¢10¢5¢
18½ Rogers' German Silver	60¢60¢
22½ Rogers' Nickel Silver	50¢60¢
German Silver	50¢50¢5¢
German Silver, Hall & Elton	50¢50¢5¢ cash
Nickel Silver	50¢50¢10¢5¢ cash
Britannia	60¢60¢5¢
Boardman's Nickel Silver, list July 1, 1891	60¢7¢5¢
Boardman's Britannia Spoons, case lots	60¢5¢ cash

**Spring**

Door—

Torrey's Rod, 39 in.	doz \$1.20@1.25
Gray's, gr. \$20.00	25¢
See Rod, gr. \$20.00	20¢25¢
Warner's No. 1, doz \$1.50; No. 2, \$3.40	55¢55¢10¢
Gem (Coll), list April 19, 1888	10¢15¢
Star (Coll), list April 19, 1888	20¢20¢5¢
Victor (Coll)	60¢10¢60¢10¢10¢
Champion (Coll)	60¢10¢60¢10¢10¢
Cowell's, No. 1, doz \$18.00; No. 2, \$15.00	50¢50¢10¢
Rubber, complete, doz \$4.50	55¢10¢
Hercules	50¢50¢10¢

**Carriage, Wagon, &c.**

Elliptic, Concord, Platform and Half	
Scroll	60¢10¢10¢
Old's Bolster Springs	25¢

**Squares**

Steel and Iron	85¢85¢5¢
Nickel-Plated	85¢85¢5¢
Try Square and T Bevels	60¢10¢10¢
Diston's Try Square and T Bevels	50¢
Winterbottom's Try and Miter	30¢10¢
Starrett's Micrometer Caliper Squares	25¢
Avery's Flush Bevel Squares	40¢
Avery's Bevel Protractor	50¢

**Squeezers**

Fodder—

Blair's	doz \$2.00
Blair's "Climax"	doz \$1.25

**Lemon**

Porcelain Lined, No. 1	doz \$6.00
Wood, No. 2	25¢30¢
Wood, Common	doz \$3.00, 35¢
Dunlap's Improved	doz \$1.70@1.75
Sammis, No. 1, \$5.00; No. 2, \$3.12	doz \$2.75, 20¢
Jennings' Star	doz \$2.50
The Boss	doz \$2.50
Dean's, Nos. 1, doz \$3.50; 2, \$3.35; 3, \$3.00	doz \$2.50
Little Giant	\$1.90; Queen, \$2.50
King	40¢5¢
Hochkiss Straight Flash	doz \$12.00
Silver & Co., Glass	gro. \$9.00
Manny Lemon Juice Extractor	doz \$0.75@1.00
Standard Improved	doz \$2.00

**Standard Fiber Ware**See *Ware, Standard Fiber.***Staples**

Blind—

Barbed, ½ in. and larger	doz 7¢7½¢
Barbed, ¼ in.	doz 3¢3½¢
Fence Staples, Galvanized	Same price
Fence Staples, Plain	See <i>Frd Rep</i>

**Steelyards****Stocks and Dies**

Blacksmith's:	
Waterford Goods	35¢
Butterfield's Goods	35¢
Lightning Screw Plate	25¢30¢
Beece's New Screw Plates	25¢30¢
Reversible Ratchet	30¢
Gardner	25¢
reen River	25¢30¢

**Stops, Bench**

Morrill's	doz \$9, 50¢
Hochkiss's	doz \$5, 10¢10¢10¢
Weston's, No. 1, \$10; No. 2, \$5, 25¢10¢5¢	
McGill's, doz \$3	10¢
Cincinnati	25¢10¢
Terrell's Nos. 1 and 2, doz, \$3; No. 3, \$3.60	30¢

**Stone**Stones, Grind—See *Grindstones.***Scythe Stones**

Pike Mfg. Co., list April, 1892	33¢1¢
Cleveland Stone Co., list Nov. 1892	33¢1¢

**Oil Stones, &c.**

Pike Mfg. Co:	
Hindustan No. 1, doz	8¢
Sand Stone, 4 to 5	40¢40¢
Turkey Oil Stone, 4 to 5	10¢
Turkey Slips	\$2.00
Washita Stone, Extra	50¢
Washita Stone, No. 1	40¢
Washita Stone, No. 2	30¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Arkansas Stone, No. 1, 3 to 5 in.	\$2.30
Arkansas Stone, No. 1 ½ to 8 in.	\$3.50
Lake Superior	\$2.13¢
Lake Superior Slips	\$2.20¢

**Stove Polish**See *Polish, Stove.***Stretchers, Carpet**

Cast Steel, Polished	doz \$2.2
Cast Iron, Steel Points	doz \$75¢80¢
Socket	doz \$1.75
Bullard's	25¢25¢10¢

**Strops, Razor**

Genuine Emerson	60¢60¢5¢
Imitation	doz \$2.00, 20¢10¢5¢
Torrey's	20¢
Badger's Belt and Com.	doz \$2.00
Lamont Combination	doz \$4.00
Jordan's Pat. Padded, list Nov. 1, 89	50¢
Electric Cutlery Co.	Net
Campbell Cutlery Co.	Net

**Stuffer, Sausage**

Miles' Challenge, doz \$20	50¢50¢5¢
Perry, doz, No. 1, \$15.00; No. 0, \$21.00	50¢50¢5¢
Draw Cut No. 4, each \$30.00	50¢50¢10¢
Enterprise Mfg. Co., list Jan 17, '93	25¢
Silver's	40¢10¢

**Sweepers, Carpet and Lawn**

Bissell No. 5	doz \$17.00
Bissell No. 8	doz \$20.00
Bissell, Grand	doz \$36.00
Standard	doz \$24.00
Domestic	doz \$21.00
Domestic, No. 2	doz \$22.00
Grand Rapids	doz \$24.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00	
Magie	doz \$15.00
Improved Parlor Queen	
Nickel	doz \$27.00
Japanned	doz \$24.00
Excelsior	doz \$22.00
Garland	doz \$18.00
Parlor Queen	doz \$24.00
Housewife's Delight	doz \$15.00
Queen	doz \$18.00
Queen, with band	doz \$18.00
King	doz \$30.00
Weed, Improved	doz \$18.00
Hub	doz \$16.00
Cog-Wheel	doz \$16.00
Ladies' Friend	doz \$15.00
Ladies' Friend No. 2	doz \$16.00
Advance	doz \$18.00
Our Leader	doz \$19.00
Triumph	doz \$20.00
Goshen	doz \$21.00
Supreme	doz \$22.00
Easy	doz \$22.00
Gilt Edge	doz \$22.00
Acme	doz \$26.00
Imperial	doz \$28.00
Grand Republic	doz \$30.00
Banner	doz \$22.00
The Star	doz \$21.00
Reliable	doz \$22.00
The Rapid	doz \$22.00
Our Own	doz \$27.00
Model	doz \$27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following re-bates:	
5 dozen in 6 months	doz \$1.00
10 dozen in 6 months	doz \$2.00
25 dozen in 6 months	doz \$3.00
Except on L.F., when 10 dozen price is \$13.50, and 25 dozen \$18.00.	

**Lawn**

Thompson Mfg. Co.	30¢
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**Tacks, Brads &c.**

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—	
American, Blued	66¢5¢
American, Tin'd and Cop'd	70¢
Steel, Bright and Blued	66¢5¢
Steel, Tinned and Coppered	70¢
Swedes Iron, Tinned	72¢5¢
Swedes Iron Tacks—	
S. S., Blued	66¢5¢
S. S., Tinned	70¢
Lanc., Blued	55¢
Lanc., Tinned	60¢
Gimp and Lace Tacks	60¢
S. S., Blued	62¢5¢
S. S., Tinned	66¢5¢
Lanc., Blued	55¢
Lanc., Tinned	60¢
Basket and Trimmers' Tacks—	
Lanc.	52¢5¢
S. S.	60¢
Hungarian Nails	60¢
Common and Patent Brads	55¢
Leathered Tacks	10¢
Brush Tacks, S. S.	60¢
Looking Glass Tacks, S. S.	35¢
Picture Frame Points, S. S.	35¢
Finishing Nails	60¢
Trunk and Clout Nails	
Black	62¢5¢
Tinned or Coppered	66¢5¢
Basket Nails	60¢
Chair Nails	52¢5¢
Cigar Box Nails	45¢
Tin Caped Nails	50¢

**Miscellaneous**

Double Point	90¢90¢10¢
Wire Carpet Nails	50¢10¢
Plymouth Rock Steel Target Tacks	25¢
Upholsterers' Nails	40¢

**Wire Brads and Nails**

Steel-Wire Brads, R. & E. Mfg. Co.'s list	50¢10¢
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See also *Nails, Wire.***Tapes, Measuring**

American	40¢40¢5¢
Spring	40¢
Chesterman's, Regular list	25¢30¢

**Thermometers**

Tin Case	80¢80¢10¢
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**Thimble Skeins—See Skeins.****Ties, Bale—Steel.**

Standard Wire, list	50¢10¢5¢
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**Tinners' Shears, &c**See *Shears, Tinners' &c.***Tinware**

Stamped, Japanned and Pieced, list Jan 20, 1887	70¢10¢70¢25¢
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**Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.****Tobacco Cutters**See *Cutters, Tobacco.***Tools****Coopers'**

Bradley's	20¢
Barton's	20¢20¢5¢
L. & J. White	20¢5¢
Albertson Mfg. Co.	25¢
Beatty's	30¢
Sandusky Tool Co.	80¢30¢5¢
Shaves Cincinnati Tool Co.	20¢

**Lumber**

Ring Peavies, "Blue Line"	doz \$20.00
Ring Peavies, Common	doz \$18.00
Steel Socket Peavies	doz \$21.00
Mail Iron Socket Peavies	doz \$19.00
Cant Hooks, "Blue Line"	doz \$18.00
Cant Hooks, Common Finish	doz \$14.00
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish	\$16.00
Cant Hooks, Mail Socket Clasp, Common Finish	doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish	doz \$14.00
Cant Hooks, Clip Clasp, Common Finish	doz \$12.00
Hand Spikes	doz 6 ft., \$15.00; 8 ft., \$20.00
Pike Poles, Pike & Hook	doz 12 ft., \$15.00; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only	doz 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00
Pike Poles, not ironed	doz 12 ft., \$8.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00
Setting Poles	doz 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
Swamp Hooks	doz \$18.00

**Saw**

Atkins' Perfection	doz \$12.00
Atkins' Excelsior	doz \$6.00
Atkins' Giant	doz \$4.00

**Transom Lifters**See *Lifters, Transom.***Traps****Game**

Newhouse	40¢40¢5¢
Onelda Pattern	70¢10¢
Game, Blake's Patent	40¢10¢5¢

**Mouse and Rat**

Mouse Wood, Choker	doz holes, 9@10¢
House, Lead Wire	doz \$1.50 10¢
Mouse, Cage, Wire	doz \$2.50 10¢
Mouse, Catch-em-alive	doz \$2.50 15¢
Mouse, Bonanza	doz 0.00@1.00
Rat, Decoy	gr \$10.00, 10¢
Ideal	gr \$10.00
Cyclone	gr \$6.25
Hotchkiss Metallic Mouse, 5-hole traps	doz, 75¢; in full cases, 60¢60¢5¢
Hotchkiss Imp. Rat Killer	gr \$18.50
Hotchkiss New Rat Killer	gr \$18.50
Schuyler's Rat Killer	gr \$15.00
Dandy	doz., \$1.75

**Triers**

Butter and Cheese	25¢
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**Trimmers, Spoke**

Bonney's	doz \$10.00, 50¢
Stearns'	20¢10¢
Ives', No. 1, \$15.00; No. 2, \$12.00	55¢10¢

**Trowels**

Lothrop's Brick and Plastering	20¢10¢5¢35¢
Reed's Brick and Plastering	15¢
Diston's Brk and Plastering	25¢
Peace's Plastering	25¢25¢5¢
Clement & Maynard's	20¢20¢5¢
Rose's Brick	15¢20¢
Brade's Brick	25¢
Worrall's Brick and Plastering	20¢
Garden	70¢
Cleves' Angle Trowel	gr. No. 1, \$30; No. 2, \$30; No. 3, \$15. net @ 10¢

**Trucks, Warehouse, &c.**

B. & L. Block Co.'s list	40¢
Thompson Mfg. Co.	25¢

**Tubes, Boiler**See *Pipe.***Twine**

Flax Twine—		BC.	B.
No. 9, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls.....	25¢	31¢	
No. 12, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls.....	22¢	30¢	
No. 18, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls.....	20¢	29¢	
No. 24, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls.....	20¢	29¢	
No. 36, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls.....	18¢	26¢	
No. 24, Mats, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls.....	25¢	25¢	
Chalk Line, Cotton, $\frac{1}{4}$ d Balls.....			55¢
Jason Line, Linen, $\frac{1}{4}$ d Balls.....			55¢
Ply Hemp, $\frac{1}{4}$ and $\frac{1}{2}$ d Balls (Spring Twine).....			15¢
Ply Hemp, 1 d Balls.....			16¢
Ply Hemp, $\frac{1}{4}$ d Balls.....			15¢
Cotton Wrapping, 5 Balls to d.....			16¢
3, 4 and 5 Ply Jute, $\frac{1}{4}$ d Balls.....			10¢
Wool.....	6¢	8¢	
paper.....	13¢	14¢	
	9	12	13
	10	12	13

<b>Washers—</b>	
Size hole.....	5-16 1/4 1/2 3/4 to 1 1/2
Washers.....	5 1/2 4 1/2 3 1/2 2 1/2
In lots less than 200 lb. \$ 10, add 1/2¢, 5-b	
boxes 1¢ to list.	
<b>Washer Cutters—</b>	
See Cutters, Washers.	
<b>Wedges—</b>	
Iron.....	\$ 10 3 1/2
Steel.....	\$ 10 3 1/2
<b>Weights, Sash—</b>	
Solid Eyes..... \$ 10 18.00 to \$19.00	
<b>Well Buckets Galvanized—</b>	
See Buckets, Well, Galvanized.	
<b>Wheels, Well—</b>	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
<b>Wire and Wire Goods—</b>	
Iron—	
Br. & Ann., Nos. 0 to 18.	
75¢ to 75¢ 10&55	
Cop'd, Nos. 0 to 18. 75¢ to 55¢	
Galv., Nos. 0 to 18. 70¢ to 50¢ 10&55	
Tin'd, Tin'd list, Nos. 0	
to 18. 70¢ to 70¢ 10&55	

<b>Stone.</b>	
Br. and Ann'd, Nos. 18	to 18. 80%
Bright and Ann'd, Nos.	19 to 26. 80% to 85%
Br. and Ann'd, Nos. 27	to 38. 82% to 85%
Tinned.....	85% to 10%
Tinned Broom Wire, 18 to 21, \$ 10. 45¢	
Galvanized Fence.....	75¢ to 10%
Brass, list Jan. 18, 1884.....	40%
Copper, list Jan. 18, 1884.....	40%
Annealed Wire on Spools.....	80%
Main's Annealed and Tin'd on Spools.....	85%
Main's Brass and Cop. on Spools.....	55%
Tate's Spooled, Tin'd and Annealed.....	80% to 85%
Tate's Spooled Cop. and Brass.....	50%
Cast Steel Wire.....	30%
Stubs' Steel Wire.....	\$6.00 to 2, 30%
Steel Music Wire, 12 to 30, imported.....	70%
Wire Clothes Line, see Lines.	
Wire Picture Cord, see Cord.	

**Bright Wire Goods—**

Standard list.....	80% to 20% 85%
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<b>Wire Cloth and Netting—</b>	
Painted Screen Cloth, good quality,	\$ 100 sq. ft. \$1.40
Galvanized Wire Netting.....	75¢ to 75¢ 10%
<b>Wire, Barb—</b>	
See Trade Report.	
<b>Wire Rope—See Rope, Wire.</b>	
<b>Wrenches—</b>	
American Adjustable.....	40%
Baxter's Adjustable "S".....	40% to 10% 50%
Baxter's Diagonal.....	60%
Coe's Genuine.....	50% to 3%
Coe's "Mechanics".....	50% to 10% 3%
Girard Standard.....	65% to 10% 70%
Lamson & Sessions' Engineers'.....	60% to 10%
Lamson & Sessions' Standard.....	70% to 10%
P. S. & W. Agricultural.....	75% to 10% 80%
Girard Agricultural.....	75% to 10% 80%
Lamson & Sessions' Agric'l.....	40% to 5%
Best & Call's.....	40%
Pat. Combination.....	35%
Merrick's Pattern.....	25%
Briggs' Pattern.....	40% to 5%
Cylinder or Gas Pipe.....	50%
No. 3 Pipe.....	50%

Aiken's Pocket (Bright).....	\$6.00, 50% to 10%
The Favorite Pocket.....	\$ 10 doz., \$4.00, 40%
Webster's Pat. Combination.....	80%
Boardman's.....	25% to 5%
Always Ready.....	50%
Alligator.....	20% to 10%
Donohue's Engineer.....	50% to 25%
Acme, Bright.....	50% to 25%
Acme, Nickel.....	40% to 25%
Hercules.....	70% to 10%
Walker's.....	55% to 3%
Diamond Steel.....	25% to 10%
Cincinnati Brace Wrenches.....	65% to 10% 3%
Taft's Vise Wrench.....	65% to 10% 3%

**Wringers, Clothes—**

Am. Wringer Co.'s list, Jan. 2, '93.....	2% cash
Colby Wringer Co., list Sept. 1, '91.....	2% cash
Lovell Mfg. Co., list Jan. 1, 1892.....	2% cash
Peeterson Mfg. Co., list Feb. 1, 1892.....	2% cash
National Wringer & Mfg. Co., list	
June 1, 1892.....	2% cash

**Wrought Goods—**

Staples, Hooks, &c., list March 17, 1893.....	85% to 10% 80% to 20%
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# Paints, Oils and Colors.—Wholesale Prices.

<b>Animal and Vegetable</b>	
<b>Oils—</b>	
Linseed, City, raw, per gal.....	@ 48
Linseed, City, boiled.....	@ 51
Linseed, Western, raw.....	@ 48
Lard, City, Extra Winter.....	@ 92
Lard, City, Prime.....	@ 90
Lard, City, Extra No. 1.....	@ 80
Lard, City, No. 1.....	@ 80
Lard, Western, prime.....	@ 88
Cotton-seed, Crude, prime.....	@ 42
Cotton-seed, Crude, off	
grades.....	@ 40
Cotton-seed, Summer Yellow, prime.....	@ 47
Cotton-seed, Summer Yellow, off grades.....	@ 42
Sperm, Crude.....	@ 77
Sperm, Natural Spring.....	@ 70
Sperm, Bleached Spring.....	@ 75
Sperm, Natural Winter.....	@ 78
Sperm, Bleached Winter.....	@ 80
Whale, Crude.....	@ 40
Whale, Natural Winter.....	@ 52
Whale, Bleached Winter.....	@ 55
Whale, Extra Bleached.....	@ 57
Sea Elephant, Bleached	
Winter.....	@ 31
Menhaden, Crude, Sound.....	@ 36
Menhaden, Crude, Southern	
Menhaden, Light Pressed.....	@ 37
Menhaden, Bleached Water.....	@ 43
Menhaden, Extra Bleached.....	@ 45
Tallow, City, prime.....	@ 50
Cocoanut, Western, prime.....	@ 50
Cocoanut, Ceylon.....	@ 7
Cod, Domestic.....	@ 38
Cod, Foreign.....	@ 40
Red Elaine.....	@ 38
Red Saponified.....	@ 54
Bank.....	@ 30
Straits.....	@ 37
Olive, Italian, bbls.....	@ 63
Neatsfoot, prime.....	@ 65
Palm, prime, Lagos.....	@ 54
<b>Mineral Oils—</b>	
Black, 29 gravity, 25 to 30	
cold test.....	@ 7
Black, 29 gravity, 15 cold	
test.....	@ 7 1/2
Black, 29 gravity, summer.....	@ 6
Cylinder, light, filtered.....	@ 14

Cylinder, dark, filtered.....	10 @ 13
Paraffine, 23 1/4 to 24 gravity.....	11 1/2 @ 12
Paraffine, 25 gravity.....	10 @ 10 1/2
Paraffine, 28 gravity.....	10 @ 10 1/2
Paraffine, red.....	8 @ 11 1/2

**Paints and Colors—**

Barytes, Foreign, 10 ton.....	\$22.00 @ 24.00
Barytes, Amer. floated.....	29.00 @ 32.00
Barytes, Amer. No. 1.....	16.00 @ 18.00
Barytes, Amer. No. 2.....	13.00 @ 15.00
Barytes, Amer. No. 3.....	11.00 @ 12.00
Blue, Celestial.....	\$ 10 @ 8
Blue, Chinese.....	40 @ 60
Blue, Prussian.....	25 @ 40
Blue, Ultramarine.....	8 @ 25
Brown, Spanish.....	3 1/2 @ 1
Brown, Vandyke, Amer.....	3 @ 3 1/2
Brown, Vandyke, English.....	3 @ 3
Carmine, No. 40, in bulk.....	3.10 @ ..
Carmine, No. 40, in boxes	
or barrels.....	3.20 @ ..
Carmine, No. 40, in ounce	
bottles.....	4.20 @ ..
Chalk, in bulk.....	@ 1.75
Chalk, in bbls., \$ 100 lb.....	33 @ 40
China Clay, English.....	@ 13.00
Cobalt Oxide, prep'd.....	9.00 @ 11.00
Cobalt Oxide, black.....	1.90 @ ..
Cobalt Oxide, black, less 100 lb.....	1.06 @ ..
Green, Paris, in bulk.....	10 @ 10 1/2
Green, Paris, 170 to 175 lb.....	10 @ 11
Green, Paris, small pack.....	12 @ 17
Green, Chrome, ordinary.....	6 @ 12
Green, Chrome, pure.....	22 @ 25
Lead, Eng., B.B. white.....	8 1/2 @ 10
Lead, Amn. White, dry or in oil.....	7 @ 7 1/2
Kegs, lots less than 500 lb.....	6 1/4 @ 6 1/2
Kegs, lots 500 lb to 5 tons.....	6 1/4 @ 6 1/2
Kegs, lots 5 tons to 12 tons.....	6 1/4 @ 6 1/2
Kegs, lots 12 tons and over.....	6 1/4 @ 6 1/2
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	@ 1/2
Lead, White, in oil, 1 to 5 lb as	
sorted tins, add to keg price.....	@ 2 1/2
Lead, Red, bbls. and 1/2 bbls.....	6 @ 7
Lead, Red, kegs.....	6 1/4 @ 7 1/2
Litharge, kegs.....	6 1/4 @ 7 1/2
Litharge, bbls. and 1/2 bbls.....	6 @ 7

<b>TERMS, &amp;c.—Lead and Litharge.—On</b>	
lots of 500 lb or over, 60 days' time or 2 1/2	
% discount for cash if paid within 15 days	
of date of invoice.	
Ocher, French Washed.....	1.35 @ 1 1/2
Ocher, German Washed.....	1 1/2 @ 2 1/2
Ocher, American.....	1 1/2 @ 1 1/2
Orange Mineral, English.....	8 1/2 @ 9
Orange Mineral, French.....	10 @ 10 1/2
Orange Mineral, German.....	8 1/2 @ 9
Orange Mineral, American.....	8 1/2 @ 9 1/2
Paris White, English Cliff	
stone.....	1.00 @ 1.15
Paris White, American.....	85 @ 75
Red, Indian, English.....	5 1/2 @ 6 1/2
Red, Indian, American.....	9 @ 10
Red, Tuscan.....	9 @ 11
Red, Venetian, American.....	\$ 100 lb. 1.00 @ 1.10
Red, Venetian, English.....	1.20 @ 1.35
Sienna, Italian, Burnt and	
Powd. \$ 100 lb.....	4 @ 5
Sienna, Ital., Burnt Lumps.....	1 1/2 @ 3 1/2
Sienna, Ital., Raw, Powd.....	1 1/2 @ 5 1/2
Sienna, Ital., Raw Lumps.....	1 1/2 @ 3 1/2
Sienna, American, Raw.....	1 1/2 @ 3 1/2
Sienna, American, Burnt and	
Powdered.....	1 1/2 @ 1 1/2
Talc, French.....	1 1/2 @ 1 1/2
Talc, American.....	1 1/2 @ 1 1/2
Terra Alba, Frch, \$ 100 lb.....	95 @ 1.25
Terra Alba, English.....	70 @ 80
Terra Alba, American No. 1.....	65 @ 75
Terra Alba, American No. 2.....	45 @ 60
Umber, Turkey, Burnt and	
Powdered.....	3 1/2 @ 4
Umber, Turkey, Bnt. Ln.....	2 1/2 @ 3
Umber, Turkey, Raw and	
Powdered.....	3 1/2 @ ..
Umber, Turkey, R'w Lumps.....	2 1/2 @ 2 1/2
Umber, Turkey, Bnt. Amer.....	1 1/2 @ 1 1/2
Umber, Turkey, R'w Amer.....	1 1/2 @ 1 1/2
Yellow, Chrome.....	10 @ 25
Vermilion, American Lead.....	11 1/2 @ 12
Vermilion, Quicksilver bulk.....	57 @ ..
Vermilion, Quicksilver, bags.....	58 @ ..
Vermilion, Quicksilver sm'r	
pkgs.....	62 @ ..
Vermilion, English Import.....	85 @ 90
Vermilion, Imitation, Eng.....	9 @ 35
Vermilion, Trieste.....	96 @ 92 1/2
Vermilion, Chinese.....	92 1/2 @ 95
Whiting Common, \$ 100 lb.....	37 1/2 @ 42 1/2
Whiting Gilders.....	45 @ 65

Zinc, American, dry.....	\$ 10 4 1/2 @ 5
Zinc, French, Red Seal.....	7 1/2 @ ..
Zinc, French, Green Seal.....	9 @ ..
Zinc, French, V. M. X.....	@ 7
Zinc, Antwerp, Red Seal.....	7 1/2 @ ..
Zinc, Antwerp, Green Seal.....	7 1/2 @ ..
Zinc, German, L. Z. O.....	6 1/2 @ 7 1/2
Zinc, V. M. in Poppy Oil, G.	
Seal, lots of 1 ton and	
over.....	10 1/2 @ 11 1/2
lots less than one ton.....	11 @ 11 1/2
Zinc, V. M. in Poppy Oil,	
Red Seal.....	@ ..
lots of 1 ton and over.....	10 @ 10 1/2
lots of less than 1 ton.....	10 1/2 @ 10 1/2
Discounts.—French Zinc.—Discounts to	
buyers of 10 bbl. lots of one or assorted	
grades, 1 1/2; 25 bbls. 2%; 50 bbls. 4%. No	
discount allowed on less than bbl. lots.	
<b>Colors in Oil—</b>	
Black, Drop, Frankfurt.....	25 @ 30
Black, Drop, English.....	12 @ 15
Black, Drop, Domestic.....	7 @ 10
Black, Lampblack, Best.....	20 @ 35
Black, Lampblack, Common.....	7 @ 13
Black, Ivory.....	35 @ 40
Blue, Chinese.....	8 @ 15
Blue, Prussian.....	20 @ 45
Blue, Ultramarine.....	12 @ 18
Brown, Vandyke.....	7 @ 12
Green, Chrome.....	8 @ 13
Green, Paris.....	18 @ 18 1/2
Sienna, Raw.....	7 @ 14
Sienna, Burnt.....	7 @ 14
Umber, Raw.....	7 @ 10
Umber, Burnt.....	7 @ 10
<b>Putty—</b>	
In barrels and 1/2 bbls.....	.013 @ .014
In tubs.....	.015 @ .016
In tin cans.....	.015 @ .024
In bladders.....	.017 @ .024
<b>Spirits Turpentine—</b>	
In regular bbls.....	33 1/2 @ 34
In machine bbls.....	34 @ 34 1/2
<b>Glue—</b>	
Low Grade.....	\$ 10 8 @ 10
Cabinet.....	12 @ 15
Medium White.....	17 @ 20
Extra White.....	10 @ 23
French.....	10 @ 23
English.....	10 @ 15
Irish.....	12 @ ..

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Canadian Representative, H. D. SIMMONS, 74 York St., TORONTO, ONT.



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